INDEX

For Volume 56

INDEX FOR VOLUME 56

AUTHOR AND SUBJECT INDEX. Junior authorship is indicated by page numbers in parentheses. Page numbers of illustrations are in boldface. A special listing is made of "new diseases, species, and varieties."

Abel, L., (874)
Abo-El-Dahab, M. K., (845), 869
Acer spp.
rubrum, growth of Ceratocystis fagacearum, C. ulmi, Fusarium oxysporum perniciosum, and Verticillium albo-atrum on xylem sap of, 1165
saccharum, chloride and sodium in, 633
acerola, susceptibility to Cercospora bunchosiae, 1114
acetate, metabolism of, by nonsporulating and sporulating cultures of Endothia parasitica, 888
Addy, S. K., 485
aerobiology, of Fusarium roseum 'Gibbosum,' 545
aflatoxin
Aspergillus flavus production of, effect of temperature, 899, 1390
in cotton seed
association with a greenish yellow fluorescence, 1104
occurrence, 889
Agallia constricta, wound-tumor virus in hemolymph of, 586
agar plate inhibition test, determination of antagonism between soil microorganisms, 882
Agnihotri, V. P., (905)
Agrios, G. N., 176
Agrobacterium spp., attraction to roots, 899
radiobacter, outgrowths on Datura, formation of, 365
tumefaciens
antitumor agents for, 131, 149
outgrowths on Datura, formation of, 365
peach, affected by root knot nematode, 150
serological relationship between Escherichia coli and E. mutabilis, 145
Agropyron mosaic virus, differentiation from wheat streak mosaic virus by cross-protection and serological tests, 902
Agropyron smithii, pathological changes in, induced by Anguina agropyronifloris, 769, **770, 771**
Agrostis palustris
infection by Pythium aphanidermatum zoospores, 149
interaction with root knot nematode, 88
Aichele, M. D., (65)
Aist, J. R., 869, (906)
L-alanine, increase in Verticillium albo-atrum pectolytic enzyme activity and production by, 871
Albersheim, P., (889), (892)
Albert, J. J., 583
Albugo candida
deposition and function of callose in, 145
effect on radish carbohydrate level, photosynthesis, and translocation by, 898
Alconero, R., 869
Alexander, J. V., 353
Alexander, L. J., 869, (884), (1301)
alfalfa
bacterial wilt inoculum from, cotyledon inoculation with, 566
Ditylenchus dipsaci
associated with, effect of environment on, 879
on, changes in amino acid and N concentrations, 1170
Fusarium oxysporum on, effect of frequency of cutting, leaf infection, and K on, 1040
leaf and stem diseases, effect on forage quality and yield, 906
penetration of roots by Pratylenchus penetrans, effect of fungal enzymes, Fusarium oxysporum, and Trichoderma viride on, 1132
Phytophthora megasperma on, varietal reaction to, 653
alfalfa mosaic virus
on Nicotiana tabacum, inclusions caused by, 875
transmission by Myzus persicae, 1028
Alhassan, S. A., 573
Allen, P. J., 255
Allen, R. M., (146)
Allen, T. C., Jr., (149), 869
almond, Dothiorella canker, a new disease of, 146
Alternaria spp., on alfalfa, effect of K, frequency of cutting, and Ascochyta imperfecta on, 1040
solani
conidiophores of
injury by ozone, 896
periodic bleeding when treated with decanoic acid, 882
hyphal tips of, nuclear division and septation in, 884
on tomato, chemical control, inhibition of mycelial growth, 805, 1430
toxicity of thiosemicarbazones to, 485
tenuis
on apple leaves, host range and factors affecting, 553
chlorosis toxin of, partial characterization and purification of, 879
mycelial growth rate in a low O_2 atmosphere, 1098
sporulation of, effect of
light on, 883
low O_2, 1098
Amador, E. J., (906), 1196
Amburgey, T. L., 870
American elm, survival of Ceratocystis ulmi in, 899
American Phytopathological Society
annual meeting abstracts, 869
annual report, 1
division reports and abstracts
Pacific, 145
Potomac, 583
fellows, 380
new members (July-Nov. 1965), 22
president's columns, 143, 725, 867
Amin, K. S., 1047, 1054
amino acid(s)
bound and free, changes in concentrations of, Ditylenchus dipsaci on alfalfa and pea, 1170
changes in leaves exposed to ozone, 904
composition of a crystalline host specific toxin, 1149
free and protein, in leaves of healthy, Radopholus similis-infected, and recovered grapefruit seedlings, 261
glutamic acid and proline, spore germination of Rhizopus arrhizus, 118
DL-phenylalanine, effect on growth of Diaporthe phaseolorum sojae, 92
role in chemotaxis of zoospores of Phytophthora spp., 907
in Ustilago avenae and U. kolleri, 1225
Amphorophora rubi (see also **aphid(s)**)
transmission of raspberry mosaic virus by, 556
anastomosis, of Verticillium albo-atrum in soil, **1110**
Andersen, A. L., (953), (1416)
Anderson, N. A., (879), (1260)
Anguina agropyronifloris, pathological changes in Agropyron smithii, induced by, 769, **770, 771**
anthracnose, on papaya
callose and periderm deposition by, 151
resistance to, 444
antibiotics
from cauliflower seeds, 497
Cenococcum graniforme, associated with, 147
phytoactin, translocation and persistence in Pinus albicaulis, 148
Phytophthora spp. and soil microflora affected by, in pimaricin-vancomycin medium, 152
Streptomyces griseus, produced by, 150
antigenicity, of Phytophthora mycelium, factors affecting, 422

antigens, from Fomes annosus, **1310**
Antirrhinum majus, differentiation of isolates of Verticillium albo-atrum on, 1155
Antonelli, E., 610
Anzalone, L., Jr., (371)
Aphanomyces root rot, of peas
relationship of Pythium spp. to, 869
suppression of cruciferous soil amendments, 1071, **1074**
Aphanomyces spp., on pea, suppression by cruciferous soil amendments, 1071
cochlioides
oospore production in crop residues, relationship to disease incidence, 887
zoospores of, chemotaxis to sugar beet seedlings, 896, 1365
euteicnes
cytological studies of, 923, **924**
development of, factors affecting, 917
differentiation, effect of peptone components on, 907
fine-structure studies of, 923, **924, 925, 926, 927**
growth
effect of peptone components on, 907
factors affecting, 917
pathogenic variability in, 871
Aphelenchus avenae, uptake of ethylene dibromide by, 888
aphid(s) (see also **Amphorophora rubi** and **Pentatrichopus jacobi**)
(see also **insect transmission** and **viruses**)
evaluation of plant susceptibility to bean yellow mosaic virus transmitted by, 269
transmission of
cucumber mosaic virus, 1420
raspberry mosaic virus by Amphorophora rubi, 556
App, Alva, (586)
apple
Alternaria tenuis on, 553, **554**
new virus on, **363**
resistance to Helminthosporium carbonum and Venturia inaequalis, 588
streptomycin residue on as related to application schedule, 584
virus infected, effect of extracts from, on pathogenic fungi, 176
apple latent virus 1, herbaceous hosts of, cell inclusions in, 838
apple leaf ghost spot, Alternaria tenuis, 553, **554**
apple mosaic virus, effect of extracts of, from apple, on pathogenic fungi, 176
appressoria
formation in Erysiphe graminis tritici, 304
Phytophthora cactorum on peach, **47**
apricot (see also **Prunus spp.**)
host for stone fruit viruses, 152
apricot pucker leaf, virus-induced disorder, 152
Aragaki, M., 145, (444), (1114)
Arceuthobium vaginatum f. crytopodum, on ponderosa pine, reduction of basal area growth by, 886
Ark, P. A., 145
Armillaria mellea
ethanol, N, and C effects on growth of, 108
glucose metabolism of, influence of ethanol on, 878
root and butt rot of stump sprouts of yellow poplar caused by, 1091
variation in culture, 1241, **1242, 1243**
Armstrong, G. M., 525, 699
Armstrong, Joanne K., (525), (699)
Arneson, P. A., 870
Ascochyta
imperfecta, on alfalfa, affected by Penicillium, 1040
pisi, effect of light on sporulation, 149
ash (see **Fraxinus americana**)
Ashelm, H., (148)
Ashworth, L. J., Jr., (889), 1104
Ashworth, R. P., (46)
aspen (see **Populus grandidentata**)
Aspergillus spp., on raisins, 1413
flavus
aflatoxin production by, effect of temperature on, 899, 1390
in cotton seed
association with a greenish yellow fluorescence, 1104
occurrence, 889
halophilicus, on soybeans, 412, **414, 415**
heterocaryoticus, invasion of rice stored at moisture contents of 13.5 to 15.5% by, 1162
niger, enzyme production by, 279
repens, on soybeans, 412
restrictus, on soybeans, 412, **414, 415**
ustus, colonization of wood by, 301
aster yellows virus
on barley, temperature effects on, 369
growth abnormalities of plants caused by, 904
multiplication in a nonvector leafhopper, 902
atrazine, effect on growth of Rhizoctonia solani, 1332
Aureobasidium pullulans, effect on radiation resistance in, by chemicals, 230
autolysis, in relation to lysis of hyphae in soil, 595
auxin
double band formation in oats resistant to Ceratocystis fagacearum, relation to, 885
production by Rhizoctonia solani, 875
Avena spp. (see **oats**)
avocado roots, production of chlamydospores and oospores of Phytophthora cinnamomi in, 1076, **1077**
Ayers, W. A., 1006, (1269)
azalea
leaf spot caused by Corynespora cassiicola, 455, **456**
Trichodorus christiei and Tylenchorhynchus claytoni on, effect of nutrients on activity of, 1024
azide-rose bengal medium, use in isolation of Fusarium spp. from red clover roots, 584

Bacillus subtilis
phosphorus toxicity in soybean, association with, 83
stimulation of Phytophthora megasperma sojae growth by, 876
bacteria
activity of cauliflower seed extract against, 497, **499**
effect on sporangial production in Phytophthora cinnamomi in liquid culture, 235
Enterobacteriaceae, plant intumescences induced by, 145
in infection court of Colletotrichum lagenarium, 886
living and heat-killed phytopathogenic, induction of non-hyperplastic galls by, **578**
phosphorus toxicity associated with, in soybeans, 83
phytopathogenic, cytochrome and oxidase tests in, 898
seedling blight of corn, control by, 885
serological detection in beans, 147
wilt inoculum from alfalfa roots, alfalfa cotyledon inoculation with, 566
bacterial brown spot, on bean and pea, 881
bacterial spot, in excised pepper and tomato leaves, effect of temperature on, 1194
bacterial wilt
on alfalfa roots, alfalfa cotyledon inoculated with, 566
on banana, insect dissemination of, 355
bacteriophages, of Pseudomonas atrofaciens in cereal seeds, 727
Baines, R. C., 691
Baker, J. H., (633)
Baker, R., (131), 149
Baldwin, C. H., (355)
banana (see also **Musa**)
crown rot of, aerobiology of Fusarium roseum 'Gibbosum' associated with, 545, **546, 547**
Pseudomonas solanacearum on, insect dissemination of, 355

Bancroft, J. B., 474, (881)
Barbe, G. D., (150)
Barker, A. W., (292)
Barker, K. R., (875), (885), 1024
barley (see also **Hordeum**)
aster yellows on, effect of temperature on symptoms, 369
barley stripe mosaic virus, in nuclei of mature leaf cells, electron microscope evidence for, 878
barley yellow dwarf virus on
effect of temperature on symptoms, 369
metabolism of, 883
covered smut, resistance to, 884
Erysiphe graminis hordei
genes for resistance to, 683
infected with, changes in protein and enzymes, 149, 1405
primary infection, 389
test method for, **1428**
ultraviolet light effect on, 1357
Helminthosporium sativum, nature of resistance to, 79
barley stripe mosaic virus
concentration of as related to hosts, strains, and time, 896
in nuclei of mature barley leaf cells, electron microscope evidence for, 878
protein, serology of, 879
purification of, with charcoal and chloroform, 1233
barley yellow dwarf virus, in barley
effect of temperature on symptoms, 369
metabolism of, 883
Barnes, G. L., 870
Barnett, C. B., Jr., 870
Barton, D. W., (113)
basidiocarp, spore trap for studying spore release of, **50**
Bateman, D. F., 238, (585), 870, (888)
Bdellovibrio bacteriovorus
reproduction in Pseudomonas fluorescens, 627, **629, 630, 631**
a yellow bacterium associated with, 899
bean (see also **Phaseolus spp.**)
bacterial diseases of, serological detection of, 147
bean yellow mosaic virus, yield reduction by, 147
Bountiful-, xanthomonads on, symptoms on, **59**
dark fixation of CO_2 by healthy and rust-affected leaves, 164
effect of temperature on exudation from, 148
Fusarium oxysporum on, 442
Fusarium root rot of
importance of lateral roots in, 292
predisposition to, 871
Fusarium solani phaseoli on, pectic enzymes associated with, 238
halo blight
identification of, 147
inheritance of tolerance to, **681**
new virus disease on, 901
Pseudomonas phaseolicola on, toxemia of, 1062
Pseudomonas syringae on, 881
resistant varieties, old and young hypocotyl tissues, longevity of Colletotrichum lindemuthianum mycelium in, 877
Rhizoctonia solani on
cell permeability increase, 886
cellulase and endopolygalacturonase distribution, 905
extracts from, change in oxidase activities in relation to lesion maturation, 888
hypocotyls infected by, respiration vs. lesion maturation, 870
southern bean mosaic virus in
change in peroxidase, 669
free nucleotides of, 871
ribosomes from, 889
Thielaviopsis basicola in roots of, detection of pectic enzymes in extracts of, 585
translocation in healthy and rust-affected, 170
Uromyces phaseoli typica on, starch patterns associated with, 899
bean common mosaic virus, transmission by Myzus persicae, effect of probing behavior and starvation on, 1079
Bean, G. A., 583
bean yellow mosaic virus
bean yield reductions by, 147
evaluation of plant susceptibility to infection with, by aphid transmission, 269
field spread from red clover, 147
self-fertile red clover homozygous necrotic with, 345
Bechtol, Mary Kay, 963
Becker, L. D., (148)
Beckman, C. H., 821
Beckwith, S., (883)
Bedford, E. R., (781)
beet western yellows virus
butanol treatment and density-gradient electrophoresis as methods of purification, 902
on lettuce, effect on flowering time and seed production, 842
beet yellows virus, Myzus persicae transmission of, inhibition by mineral oil, 1210
Bega, R. V., 870
Belamcanda chinensis, new host for Puccinia iridis, **804**
Bell, A. A., 583, (880)
Bell, D. K., 1361
Belonolaimus longicaudatus, effect on Fusarium wilt of cotton, **321**
Benson, A. P., (901)
bentgrass (see **Agrostis palustris**)
Beraha, L., 870
Berg, L. A., 583
Bergeson, G. B., 1287
Berkenkamp, B., 349
Bernier, C. C., 1245
Betula lenta, growth of Ceratocystis fagacearum, C. ulmi, Fusarium oxysporum perniciosum, and Verticillium albo-atrum on xylem sap of, 1165
Beutte, M. K., 871
Biehn, W. L., 588
biological control, mechanisms for, in a bean root rot soil, 953
seedling blight of corn, 885
biotin, effect on growth of Phytophthora, 812
Birchfield, W., 871, (883)
Bird, L. S., 871, (896)
birdsfoot-trefoil
blight of, caused by Phomopsis loti sp. n., 760
Diaporthe phaseolorum sojae on, stem canker and blight caused by, 396, **398, 399**
Phomopsis loti on, factors related to disease development by, 791
tomato ringspot virus in, occurrence of, 585
black knot, on plum, factors involved in outbreaks of, 586
black shank, on tobacco, sources of resistance to, 678
Blanc, F. L., (150)
Blasticidin S, inhibition of tobacco mosaic virus multiplication by, 1236
Blodgett, E. C., (65)
Bloom, J. R., (871)
Bloss, H. E., 92, (907)
Bolwyn, B., (150)
Bonck, R. J., (901)
Bone, H. T., (134)
Boone, L. V., (829), (850)
Booth, J. A., 871
boron deficiency, in relation to
corky root rot of lettuce, 1047
sweet cherry virus, 150
Botryodiplodia theobromae, on sycamore, 878

Botryosphaeria ribis
effect of C and pH on growth of, 876
pectic enzyme production by, 891
Botrytis spp., on strawberries, effect of ozone on, 586
cinerea
control of, in low O_2, 1339, 1345
effect on radiation resistance in, by chemicals, 230
enzyme production by, 279
mycelial growth rate and sporulation in a low O_2 atmosphere, 1098
squamosa, diurnal periodicity of conidia of, 887
Bougainvillea
glabra 'Sanderiana,' leaf spot caused by Cercospora bougainvilleae, 128
spectabilis lateritia, leaf spot caused by Cercospora bougainvilleae, 128
Bourret, J. A., (353)
Bowman, Pamela, 871
Bozarth, R. F., 871
Bracker, C. E., (474), 871
Brandt, R. W., (900)
Brannaman, B. L., (149), (883), (1405)
Brassica
napobrassica, reaction to Plasmodiophora brassicae, 624
oleracea capitata, reaction to Plasmodiophora brassicae, 624
Bremia lactucae, colonization and survival in lettuce, 856
Bricker, J. L., (1012)
Brim, C. A., 451
Bringhurst, R. S., 219
Brodie, D. B., 871
Brown, D. H., (148)
Brown, G. E., 407
Brown, L. F., Jr., 583
brown rot, on heated and nonheated peaches, relation of cooling methods to, 586
brown stem rot, on soybean, factors influencing spread, 298
Browning, R. E., (871)
Bruehl, G. W., (213), 766, (1100)
Buckley, Patricia M., 145, 872
buckthorn, use in oat resistance to crown rust, 891
bud indexing, failure to detect prune dwarf virus in cherry trees, 650
Buddenhagen, I. W., 999
bunt, in 16th Century herbals, 853, **854, 855**
bur oak, Ceratocystis fagacearum on, effect on cambial activity and diurnal hydration by, 892
Burke, D. W., 292, 871
Burleigh, I. R., 872
Burrell, R. G., 422
Bush, L. P., (860), 872
Bushong, J. W., 376
N-butyric acid, formation of, in flooded soils, killing of nematodes by, 1015
Buxus sp., Phytophthora cinnamomi on, variation of pathogenicity, 585
Byler, J. W., 1091
Bythor, R. S., 1314

cabbage
Fusarium spp. on, common hosts for, 525
Plasmodiophora brassicae on
cytochemical study of hypertrophy caused by, 521, **523**
race determination of, 624
Rhizoctonia on, resistance to, **367**
Calavan, E. C., 145
calcium
corky root rot of lettuce, deficiency in relation to, 1047
in oats, suppression of victorin-induced symptoms in, 875
in safflower, in relation to resistance to Phytophthora drechsleri, 985
Caldwell, R. M., (897)
California tobacco rattle virus
characterization of, 738, **741**
purification of, 738, **741, 745**
on tobacco
cytology of infected cell, 744
intracellular appearance, 744, **749, 750, 752, 754**
symptoms of, 739, **740**
callose
deposition and function in Peronosporales, 145
deposition in and relation to resistance of papaya fruit, 444, **448**
formation of, in relation to anthracnose resistance in papaya, 151
Calonectria crotalariae, new disease on peanuts, 1361, **1362**
Calonectria nivalis, perfect stage of Fusarium nivale, occurrence in field in North America, **1100**
Calpouzos, L., 702
Caltrider, P. G., 479
Cameron, H. R., 145, 812, 872
Campbell, Georgette J., (134)
Campbell, R. N., (146)
Campbell, W. A., 872
Candida tropicalis, effect on radiation resistance in, by chemicals, 230
cankers, peach seedling, induced by chilling, 146
Cappellini, R. A., 734
carbohydrate, utilization by Fusicladium effusum, 870
carbon-14
distribution in potato in relation to leaf infection by Phytophthora infestans, 1184, **1187, 1188**
inability to move into opposite noninoculated primary leaves of cowpea, **562**
carbon dioxide, dark fixation of, by
healthy and rust-affected leaves of wheat and bean, 164
malic enzyme of Puccinia graminis avenae and Uromyces phaseoli, 897
carbon dioxide tension, Fusarium oxysporum growth, 183
Carley, H. E., 146, (352)
carnation, Pseudomonas caryophylli on, histology of, in infected tissues, 154, **156, 157, 158, 159, 160, 161**
Carns, H. R., (375), (899)
Carpenter, J. B., 146
Carroll, T. W., 146, (627), 873, 1348
carrot, role of MMHD in resistance to Ceratocystis fimbriata and Thielaviopsis basicola, 187
Carthamus tinctorius (see **safflower**)
Carver, R. B., 873
Cassia tora, Fusarium oxysporum cassiae form. nov. on, 699
Castillo, M. B., 1028
Castro, C. E., 888
cauliflower, antibiotic from, 497, **498**
celery, Pratylenchus penetrans on roots of, 1320
cell death (see also **senescence**)
in corn stalk tissue, effect of soil fertility on, 850
in sorghum, relationship to Colletotrichum graminicola, 468
cell permeability, bean-infected Rhizoctonia solani, increase in, 885
cellulase (see **enzymes**)
Cenococcum graniforme, antibiotic associated with, 147
Cephalosporium sp., in corn kernels and seedlings, histology of, 903
gramineum
effect of establishment in host tissues on survival, 766, **768**
infection, relation to autumn root growth of winter wheat, 895
survival in naturally infested wheat straws in soil, 213
gregatum, on soybean, factors influencing spread of, 298, **299**
Ceratocystis
fagacearum
asexual nuclear behavior using HCl-Giemsa, 906

asexual nuclear division in, study of, by phase-contrast microscopy, 869
on bur oak, effect on cambial activity and diurnal hydration, 892
detection on insects, 902
growth on xylem sap of trees, 1165
Hypoxylon punctulatum as a control of, 772, **773**
oak resistance to, relation of auxin to double band formation, 885
fimbriata
role of MMHD in carrot resistance to, 187
on stone fruits, role of insect vectors, 891
on sweetpotato
induced immunity to, 1066, **1068**
resistance to, 1066
ulmi
fungicides for, 25
growth on xylem sap of trees, 1165
Hemiptelea davidii resistance to, 881
survival in American elm seedlings, 899
Cercospora
beticola, phototropism by conidiophores, 702, **703**
bougainvilleae, leaf spot of Bougainvillea, **129**
bunchosiae, susceptibility of acerola to, 1114
hayi, spore dispersal and survival, influence of rain and wind on, 1290
Cercospora sojina, on soybean, change in P^{32} and starch caused by, **987**
pigment caused by, 987
Cercosporella herpotrichoides
effect of establishment in host tissues on survival, 766
observations in soil, 1314, **1315**
cereals, bacteriophages in, 727
Chacko, C. I., 576, 873
Chaetomium sp., seedling blight of corn, control by, 885
Chakravarti, B. P., 223
Chamberlain, D. W., 70, (894)
Chambers, A. Y., 873
Chang, I-Pin, (885)
charcoal root disease, effect of temperature fluctuations on, 61
chemotherapy, ammonium compounds for, 23
Chenopodium
amaranticolor
grape yellow vein virus on, **660**
peach yellow bud mosaic virus on, **660**
semilatent seed-borne virus in, characterization and purification of, 884
tomato ringspot virus on, **660**
quinoa
apple latent virus in, cell inclusions, 838, **840**
potato virus Y on, **1394**
raspberry virus on, symptoms, **1247**
Chenopodium star mottle virus, electron microscopy of, 890
cherry (see also **Prunus spp.**)
prune dwarf virus in, failure to detect by bud indexing, 650
sour- (see **Prunus** cerasus)
sweet- (see **Prunus** avium)
viruses, characterization of six isolates from, with Eola rasp leaf, 149
Cherry, E., 1102
cherry rugose mosaic virus, similar symptoms to recurrent ringspot and sour cherry yellows viruses, 150
Chiykowski, L. N., (902)
chlamydospores
conversion of macroconidia to, by Fusarium oxysporum batatas, 1322
conversion of microconidia to, by Fusarium oxysporum pisi, 721
formation by Fusarium solani in sterile soil extracts, **353**
Fusarium oxysporum batatas, as overwintering propagules and primary inoculum, 878
Phytophthora cinnamomi, production in avocado roots and soil, 1076
survival propagules of Thielaviopsis basicola in soil, 1012, **1014**
Thielaviopsis basicola
albino, behavior of, 887
physiology of germination of, 337
chloroform, purification of barley stripe mosaic virus with, 1233
chlorogenic acid, biosynthesis in potato resistant to Verticillium albo-atrum, 971
Christensen, C. M., 412, (619), (1162)
Christiansen, D. W., (145)
chrysanthemum, rooting failure due to excess of K and sodium, 713, **715**
chrysanthemum stunt virus, cineraria as a starch lesion assay host for, 886
Chung, H. S., 873
cineraria, starch lesion assay host for chrysanthemum stunt virus, 886
Cirulli, M., (869), 1301
citrus
grapefruit, occurrence of stubborn disease virus in normal-appearing and diseased, 146
seed abortion caused by stubborn disease virus, 145
transmission of tatter leaf virus to, 575
Citrus spp. (see also **grapefruit, lemon,** and **orange**)
scion and rootstock effects on Tylenchulus semipenetrans reproduction, 438
Civerolo, E. L., 874
Cladosporium
fulvum, on tomato, effect of minerals on reaction to, 493, **494**
herbarum, mycelial growth rate and sporulation in a low O_2 atmosphere, 1098
Clare, B. G., 1334
Clark-type electrode, determination of O_2 consumption of Puccinia graminis uredospores with, 872
Clason, G. W., (893)
Clayton, C. W., (422)
Clifford, B. C., 874
Clitocybe tabescens, amount of N in spores of, 1083
clover (see **Trifolium pratense**)
clover yellow mosaic virus, electron microscopy of, 895
Cobb, F. W., Jr., 874
Cochliobolus sativus, effects of fungi on, 776, **779**
Cohen, S., 1127
Colletotrichum
fragariae, overwintering of, 873
gloeosporioides
on papaya, resistance to, 444, **447**
periderm and callose deposition in papaya, resistance to, 151
graminicola, spread in sorghum, relationship of cell death to, 468
lagenarium, bacteria in infection court of, 886
lilii, on Easter lily, effect of temperature on development of, 1106
lindemuthianum
enzymes, degradation of plant polysaccharides by, 889
in resistant beans, old and young hypocotyl tissues, longevity of, 877
trifolii, production of pectate lyase in relation to pH change, 1112
Collins, R. J., (1312)
Collins, T. I., (872)
Compton, O. C., (150)
computers, use with Barratt-Horsfall rating system, 583
conidia, Verticillium albo-atrum, movement in cotton, 375
Connor, S. R., 583
Consigli, R. A., (877)
Converse, R. H., 556, 637
Cook, A. A., (1152)
Cook, R. J., 874, 1100

Cooper, R. L., (884)
Cooper, W. E., (905)
Coplin, D., (151), (899)
Corbin, J. B., 874
Cordner, H. B., (1217)
corn
cell death in, effect of
planting date on, 829
soil fertility on, 850
Diplodia maydis on, relationship to soluble solids content, pith condition, and hybrids, 26
Fusarium roseum on, bacteria and Chaetomium for control of, 885
maize dwarf virus on
biological and physical properties of, 474
serological comparison of, 1422
Puccinia graminis, resistance to, histology of, 1305, **1307**
Puccinia sorghi
culture on detached leaves of, 536, **538**
heat predisposition to, 510
stalk rot susceptibility, effect of planting date on, 829
relation to kernel infection, 903, 983
Ustilago maydis on, hydrocarbon changes in, 886
viruses in, predisposition to pathogens, 892
corn rust, heat predisposition to, 510
corn stunt virus, transmission by leafhoppers, 584
Corynebacterium insidiosum, on alfalfa roots, alfalfa cotyledon inoculated with, 566
Corynespora cassiicola, on azalea and hydrangea, 455, **456**
cotton (see also **Gossypium**)
aflatoxins in, 889, 1104
Aspergillus flavus in, 889, 1104
exudation from, effect of temperature on, 148
fungitoxins from, isolation of, 583
Fusarium wilt of
effect of Fusarium oxysporum vasinfectum and Meloidogyne incognita populations on, 894
effect of nematodes on expression of, 319
resistance of and fungicides for, 871
leaf spot, histology of, 906
Pythium spp. on, control by fungicides, 871
Rhizoctonia solani on, control by fungicides, 871
root knot nematode resistance of, 871
seed, fluorescence of, association of aflatoxin and Aspergillus flavus with, 1104
seedling disease of, effect of soil temperature on, 896
serological behavior of, 900
Thielaviopsis basicola on,
cause of yield reduction, 1213
root penetration, **1215**
Trichodorus christiei on, 573
Verticillium albo-atrum
conidia movement in, 375
cross protection with strains of, 151, 1204, **1206, 1207**
in development of, 1121, **1122, 1125**
differentiation in isolates of, 1155, **1156, 1158**
dissemination with seed, 460
effect of Thielaviopsis basicola, 888
in penetration of, 1121, **1122**
resistance to, 899
wilt in, inoculum increase of, 590
Couch, H. B., 781
Couey, H. M., 1339, 1345
Coulson, J. G., (1062)
covered smut, barley resistance to, interpretation of partially smutted plants, 884
Cowling, E. B., (886), (890), (1083), (1324)
cowpea (see also **Vigna sinensis**)
C^{14} in, inability to move into opposite noninoculated primary leaves of, **562**
peach yellow bud mosaic virus in, inability to move into opposite primary leaves of, **562**
transmission of tatter leaf virus from, 575
cowpea chlorotic mottle virus, properties of, 881
creeping bentgrass (see **Agrostis palustris**)
creeping red fescue, pathogenicity of
Pratylenchus penetrans on, 995, **996**
Tylenchorhynchus claytoni on, 995
Crittenden, H. W., (92), (586)
Cronartium
fusiforme
abjection of secondary sporidia of, **1326**
germination and storage of aeciospores of, 1328
ribicola, basidiospores labeled with fluorescent brightener, penetration of Pinus strobus by, 894
crop residues, phytotoxicity of, 146
crop rotation, as factor in influencing spread of brown stem rot of soybeans, 298
Crosby, E. S., 720
Crossan, D. F., (235), 584
crown gall (see **Agrobacterium tumefaciens**)
crown rot, of boxed bananas, aerobiology of Fusarium roseum 'Gibbosum' associated with, 545
crown rust
oats resistance to, 880
oats resistance to, use of buckthorn, 891
cucumber
cucumber mosaic virus on, oil sprays for prevention of, 512, **514**
powdery mildew on, fine structure and isolation of haustoria from, 584
cucumber angular leaf spot, protease of Pseudomonas lachrymans in relation to, 883
cucumber mosaic virus
in dahlia, 343
oil spray for prevention of, 512
serological behavior of, 900
serological identification of, 152
synergism with Pythium ultimum, 1386
in tobacco callus tissues, 731
transmission by Myzus persicae, 870, 1028, 1420
Cunninghamella blakesleeana, toxicity of thiosemicarbazones to, 485
Curl, E. A., 874, (897), (1332)
curl-stripe disease, of Lilium longiflorum, viruslike particles associated with, 869
Curtis, C. R., 1316
Cyamopsis tetragonoloba, effect of light and N on reaction to Xanthomonas cyamopsidis, 893
Cylindrocladium scoparium, spot plate technique for bioassay of, **1116**
cytochemical study, hypertrophy in clubroot of cabbage, 521
cytokinin, increase of, in tobacco infected with Meloidogyne incognita, 885
cytology
Aphanomyces euteiches, 923
California tobacco rattle virus on tobacco, infected cell, 744
effect of extracts from virus-infected apple and pear tissues on, 176

Daft, G. C., (886)
dahlia, cucumber mosaic virus of, 343
Dalbulus maidis, transmission of corn stunt virus by, 584
Dale, J. L., (1422)
Dallimore, C. E., 874
Daly, J. M., 164, (170), (610), (870)
Datura stramonium
distribution of TMV in, determined by electron microscopy and immunofluorescence, 146, 1348
enhancement of outgrowth formation on, by bacteria, **365**
tomato yellow leaf curl virus on, **1130**
Daubeny, H. A., (361)
Davis, D., 825
Davis, E. E., 1432
Davis, J. R., 146, (146)
Davis, N. D., (1390)

Davis, T. C., 772
Davison, A. D., (148)
Day, M. H., (531)
DDT, degradation of, by Streptomyces venezuelae and Trichoderma viride, 873
Dean, G., (904)
Dean, J. L., 1342
decanoic acid, periodic bleeding of conidiophores treated with, 882
De Groot, R. C., 875
Dekhuijzen, H. M., 584
Delgado-Sanchez, S., 1394, 1397
Denis, S. J., 584
Desjardins, P. R., 347, 875
Deutsch, Miriam, (512)
DeVay, J. E., (146), (627), (891), (899)
DeWolfe, T. A., (691)
Dexon, effect on soil microflora, persistence, 869
de Zoeten, G. A., 738, 744
Diachun, S., 345, 875
Diaporthe phaseolorum sojae
effect of amino acids and sugars on growth of, 92
stem canker and blight on birdsfoot-trefoil and soybeans caused by, 396
Dibotryon morbosum, on plum, factors involved in outbreaks of, 586
Dickerson, O. J., (816)
Dickey, R. S., (154)
dieldrin, degradation of, by Streptomyces venezuelae and Trichoderma viride, 873
Diem, A. F., (1006)
Diener, T. O., 875
Diener, U. L., 1390
Dimond, A. E., (864), (894), (981)
Dinoor, A., (346)
Diospyros virginiana, growth of Ceratocystis fagacearum, C. ulmi, Fusarium oxysporum perniciosum, and Verticillium albo-atrum on xylem sap of, 1165
Diplocarpon rosae, on rose
decline of virulence on conidia, 1283
pathogenicitv on excised leaflets, 1277, **1278**
season variation in host susceptibility, 1283
Diplodia maydis, relation of soluble solids content and pith condition to, 26
Dirks, V. A., (1376)
diseased tissues, selective accumulation of water in, 152
dissemination, Verticillium wilt with cotton seed, 460
Ditylenchus
destructor, cultures of, on potato plugs, 874
dipsaci
on alfalfa
changes in amino acid and N concentrations, 1170
effect of environment on, 879
on pea
changes in amino acid and N concentrations, 1170
spore germination inhibition by, 882
diuron, effect on growth of Rhizoctonia solani, 1332
DMSO, with SPCP, effect on Monilinia fructicola, 874
Dodman, R. L., 875
dollar spot of turfgrass, control by N, 877
Donnelly, E. D., (102), (180)
Dorworth, C. E., (412)
Dothidella ulei
new medium for culturing of, 564
production of toxin by, 718
Dothiorella canker, a new disease of almond trees in California, 146
Dothistroma pini, infection of Pinus nigra and P. ponderosa by, 894
Douglas-fir, invasion of, by Fomes annosus, 874
Doupnik, B., Jr., 875
Dowler, W. M., (46), 989
downy mildew, on lima beans, overwintering of, 95
Drake, C. R., 876, (891)
Drechsler, C., (95)
Driver, C. H., (897)
Duffus, J. E., (842), (902)
Dukes, P. D., (183)
Dunleavy, J., 83, 298, 876
Duran, R., (136)
Durbin, R. D., (870)
dwarf mistletoe, on ponderosa pine, reduction of basal area growth by, 886

Easter lily
Colletotrichum lilii on, effect of temperature on development of, 1106
viruslike particles from, purification of, 874
Eckert, J. W., 876
Edgington, L. V., 23, 876
Edmunds, G. F., Jr., (897)
Edmunds, J. E., 1132, 1320
Edmunds, L. K., 876, (903)
Ehrlich, H. G., (876)
Ehrlich, Mary A., 876
Eisenberg, W. V., (899)
electron microscopy (see also **fine structure** and **ultrastructure**)
Chenopodium star mottle virus, 890
clover yellow mosaic virus, 895
Erwinia amylovora, 891
Erysiphe cichoracearum haustoria, 889
penetration sites located by, 1412
potato spindle tuber virus, 901
potato virus Y, 1397, **1402**
Pseudomonas phaseolicola, 891
sugarcane mosaic virus, 371
sweetpotato internal cork virus, 898
tobacco mosaic virus, 146, 192, 1348, **1351, 1352**
electrophoresis (see also **techniques**)
soybean leaf protein, comparisons of, from varieties resistant to Phytophthora megasperma sojae, 287
El-Goorani, M. A., (845), (869)
El-Hadidi, A. F., 877
El-Helaly, A. F., 845
El-Kandelgy, S. M., (364), 832
Ellingboe, A. H., (304), (389), (683), (891)
Elliott, E. S., (584)
El-Tobshy, Z. M., 877, (901)
El-Zayat, M. M., 877
Endo, R. M., (149), 877, (888)
endoconidia, Thielaviopsis basicola, germination physiology of, 337
endopolygalacturonase (see **enzymes**)
Endothia parasitica, metabolism of acetate by, cultures of, 888
English, H., 146, (146)
English, P. D., (892)
environment, effect on
association Ditylenchus dipsaci to alfalfa, 879
Erysiphe graminis tritici, secondary hyphae, 891
enzymes (general) (see also **enzymes,** specific)
in barley, leaves infected with Erysiphe graminis, 149
extraction from rust uredospores, 860
glutamic acid converted to proline in spore germination of Rhizopus arrhizus, 113
fungal-, effect upon penetration of alfalfa roots by Pratylenchus penetrans, 1132
enzymes (specific) (see also **enzymes,** general)
cellulase, synthesis of
in cellulolytic fungi, 886
sugar repression of, 908
endopolygalacturonase, sugar repression of, in onion pink root, 908
malate dehydrogenase, in barley, infected Erysiphe graminis, 149
oxidases, Rhizoctonia-infected bean hypocotyl extracts, relation to lesion maturation, 888
pectate lyase, production by Colletotrichum in relation to pH, 1112

pectic-
from Botryosphaeria ribis, 891
in Fusarium solani phaseoli culture and diseased bean, 238
in Pseudomonas marginalis, 1414
in Thielaviopsis culture filtrates and infected bean tissue, 585
pectin lyase, production by fungi, 279
pectolytic-, produced by Verticillium albo-atrum, 871
peroxidase, changes in bean infected with southern bean mosaic virus, 669
polygalacturonase
production by
fungi, 279
of Rhizopus stolonifer, 734
of pyrenochaeta terrestris, 603
Rhizoctonia solani, 1006
polygalacturonate trans-eliminase
production by
Fusarium oxysporum and F. solani, 1269
Rhizoctonia solani, 1006
protease
of diseased fruit, 1424
of Pseudomonas lachrymans, 884
ribonuclease, factors affecting viral infectivity, 149
Epicoccum spp., diurnal periodicity of conidia liberation, 988
epidemiology
of fire blight of pear, role of Erwinia amylovora in, 464
rust spores in rain, 807
Epps, J. M., (873)
EPTC, effect on growth of Rhizoctonia solani, 1332
Erb, K. L., 877
Eriobotrya japonica, Spilocaea eriobotryae on, 147
Erwin, D. C., (401), 653
Erwinia
amylovora
control by streptomycin, 584
electron microscopy of, 891
fire blight of pear, role in epidemiology of, 464
nutritional requirements of, 845, **846**
susceptibility of pear seedlings to, 145
nigrifluens, serology of, 907, 1381
Erysiphe
cichoracearum
conidia, water content of, 1031
haustoria, electron microscope studies of, 889
graminis
conidia, water content of, 1031
primary infection of barley and wheat, 389
graminis hordei
genes for resistance to, in barley, 683
on Hordeum vulgare
fluctuation of starch amount caused by, 1220
protein and enzyme changes made in, 1405
test method for, on barley, **1428**
ultraviolet light effect on, 1357
graminis tritici
germination of conidia, formation of appressoria, and secondary hyphae in, 304, **305**
secondary hyphae, effect of environment on, 891
polygoni
effect of temperature on growth and sporulation of, **942**
morphology of, 309, **315**
pathogenicity on legumes, 309
red clover resistance to, 875
on Trifolium pratense
effect of relative humidity and temperature on development of, 940
race identification and maintenance, 795, **797**
reaction of clones to, 957, **961**
Escherichia spp., plant intumescences induced by, 145
coli and mutabilis, serological relationship with Agrobacterium tumefaciens, 145
ethanol, Armillaria mellea
glucose metabolism related to, 878
growth-promoting effects, 108
ethylene dibromide, uptake by Aphelenchus avenae, nematodes, and Tylenchulus semipenetrans, 888
ethylene oxide, use in storage of culture media, 352
ethylene thiuram monosulfide, detection of, 584
Eutypella parasitica, of sugar maple, 885
Evans, G., 460, 590
Everett, T., (584)
Eversmeyer, H. E., 816
exudates, effect of temperature on, from bean and cotton seed, 148
Eyal, Z., 584

Fanse, H. A., 1162
Farkas, G. L., 669
Feldman, A. W., (261), 1312
Fenwick, H. S., (147)
Filer, T. H., Jr., 878
fine structure (see also **electron microscopy** and **ultrastructure**)
Aphanomyces euteiches, 923
Finley, A. M., (953)
Fisher, K. D., (898)
flat limb virus, from apple tissues, effect of extracts of, on pathogenic fungi, 176
flavensomycin, inhibition of fungi by, 879
flax, Rhizoctonia solani from
heterokaryons and single-spore isolates, behavior, 1260
heterokaryosis and virulence of, 879
Fleischmann, G., (346)
fluorescence, of cotton seed, association of aflatoxin and Aspergillus flavus with, 1104
fluoride, stimulation of virus-induced local lesions by, 904
Follstad, M. N., 1098, (1339), (1345), 1413
Fomes
annosus
atmosphere moisture regime in habitat of, 899
basidiospores, patterns of release, 906
colonization of Pinus elliottii by, factors, 897
influence of oleoresins on, 870
invasion of Douglas-fir, ponderosa pine, and redwood by, 874
macromolecular antigens prepared from, **1310**
recovery of spores from soil, 885
temperature regime in habitat of, 899
applanatus, N in spores of, 1083
fomentarius, N in mycelium of, 1083
laricis, N in mycelium of, 1083
rimosus, basidiospore release, annual and diurnal patterns of, 901
Forbes, I. L., 878
Ford, R. E., 858, 878
Foster, R. E., 146
Fragaria chiloensis (see also **strawberry**)
Phytophthora fragariae, reactions to, 361
Verticillium wilt resistance in, **219**
Frankel, H., (512)
Fraxinus americana, transmission of a ringspot-like virus from leaves of, 323
Frazier, N. W., 568, 571, 1318
Frederiksen, R. A., (903)
Freeman, T. E., (887)
Freitag, J. H., (904)
French, D. W., (301)
French, E. R., 878, 1322
Frosheiser, F. I., 566
fruit spoilage fungi, reduction of radiation resistance in, by chemicals, 230
fruit trees, Pseudomonas spp. on, systemic infection by, 872
Fry, P. R., 146
Fucikovsky, L. A., 987
Fulton, R. W., 575, (904)

fumigants, effect on control of soil-borne pathogens of tomato, 929
Funderburk, H. H., Jr., (874), (897), (1332)
fungi
conidia, differences in nature and number of ligands binding heavy metals, 890
inhibition by flavensomycin, 879
silica gel diffusion technique for determining germination and growth responses to nutrients, **248**
spores of, sensitivity to ozone and sulfur dioxide, 880
fungicides (general) (see also **fungicides,** specific)
ammonium compounds, uses as systemic-, in tomato, 23
cotton seedling disease, control by, 871
fungitoxicity of thiosemicarbazones, 485
inoculum potential of spermosphere fungi, affected by, on peanut, 905
oxathiin systemic, effect on Urocystis cepulae, 876
postharvest decay control of cherries, nectarines, peaches, and plums with, 893
simultaneous determination of fungistatic and fungicidal properties of, 203
translocation in Prunus domestica, 933
on Venturia inaequalis, 583
fungicides (specific) (see also **fungicides,** general)
2-aminobutane, effect on Monilinia fructicola, Penicillium digitatum, and P. expansum, 876
captan, effect of Venturia inaequalis, 583
Ceresan, control of Verticillium albo-atrum, 460
copper-A-compound, for leaf spot of Bougainvillea, 129
cyano (methylmercury) guanidine, effect on Urocystis agropyri, 98
Dexon, effect on soil microflora and persistence, 869
1,2-dibromo-3-chloropropane for Pythium control, 1386
difolatan
effect of ultraviolet radiation on fungicidal efficacy of, 151
prevention of perithecial development of Venturia inaequalis, 583
dimethylaminobenzenediazo sodium sulfonate for Pythium control, 1386
dodine, effect on Venturia inaequalis, 583
glyodin, effect on Venturia inaequalis, 583
hexachlorobenzene, effect on Urocystis agropyri, 98
maneb, protection for leaf spot of Bougainvillea, 129
morestan, effect on Venturia inaequalis, 583
Panogen, control of Verticillium albo-atrum on cotton seed, 460
tetrachloronitroanisole, effect on Urocystis agropyri, 98
thiram, response of Glomerella cingulata to, 897
zineb, effect on Puccinia graminis tritici, on wheat, 223
fungistasis
nutrition of spores, relation to, 885
a quantitative method of assaying for, 576
simultaneous determination of properties of, in chemicals, 203
of soil on dissemination and seedling infection of Verticillium, 549
fungitoxicity
simultaneous determination of properties of, in chemicals, 203
of thiosemicarbazones, 485
Funk, C. R., (1294)
fusaric acid, in plant tissues, estimation of concentrations of, 888
Fusarium spp.
azide-rose bengal medium use in isolation from red clover roots, 584
biological control by, 953, **954, 955**
on cotton, control by fungicides, 871
culmorum, effect of establishment in host tissues on survival, 766, **768**
moniliforme
in corn kernels and seedlings, histology of, 903
kernel and stalk rot of corn, 983
root rot of sorghum, 148
survival of, thickened hyphae as a mechanism of, 893
nivale
Calonectria nivalis as perfect stage of, occurrence in North America, **1100**
effect of establishment in host tissues on survival, 766
oxysporum
on alfalfa, effect of
frequency of cutting, K, and leaf infection on, 1040
root penetration by Pratylenchus penetrans, 1132
on bean pods, a quasi-parasite, 442, **443**
polygalacturonate trans-eliminase production by, 1269
in soil, reduction by pine duff extracts, 889
oxysporum f. batatas
chlamydospores
conversion of, from macroconidia, 1322, **1323**
overwintering propagules and primary inoculum, 878
sweetpotato resistance to, 1217
oxysporum f. cassiae form. nov. on Cassia tora, 699
oxysporum f. conglutinans, races of, 525
oxysporum f. cubense, on banana, interaction of 3-indoleacetic acid and 3-hydroxytyramine, 245
oxysporum f. lycopersici
enzyme production by, 279
fungicides for, 24
on tomato
comparison of pathogenic isolates and resistance to, 1301
effect of fumigants on, 929
resistance to, breaking of, by nematodes, 871
oxysporum f. perniciosum, growth on xylem sap of trees, 1165
oxysporum f. pisi, pea root exudates affecting germination of, 721
oxysporum f. tracheiphilum, growth response to O_2 and CO_2 tensions, 183
oxysporum f. vasinfectum, effect of
nematodes on, 319, **320, 321**
population on wilt of cotton, 894
roseum
on corn, control by bacteria and Chaetomium, 885
on Hubbard squash, storage rot by, 146
on turfgrass, factors affecting, 583
roseum f. cerealis, on turfgrass, 781
roseum f. cerealis 'Avenaceum,' Gibberella spp. as perfect stage of, 874
roseum 'Gibbosum,' spore dispersal of, 545
solani
colonization of wood by and selective medium for, 301
formation of chlamydospores, 353
polygalacturonate trans-eliminase production by, 1269
solani f. phaseoli
hyphal lysis in soil, 595, **596, 1416**
pectic enzymes in culture and association with infected bean tissue, 238
predisposition of bean to, 871
root rot of beans, importance of lateral roots, 292
solani f. pisi, hyphal lysis in soil, 595
tricinctum f. poae, on turfgrass, 781
Fusarium blight, on turfgrass, 583
Fusarium root rot, predisposition of bean to, 871
Fusarium wilt
cotton resistance to, 871
cross-infection in, 825
Fusicladium effusum, utilization of carbohydrates by, 870

Gabrielson, R. L., 146
Galactia spp., local lesion host for pea enation mosaic virus, **458**
galactose, counteraction of glucose inhibition of root elongation by, 888
Gallegly, M. E., (422), (583), (877)
galls, non-hyperplastic, induced by living and heat-killed pathogenic bacteria, **578**
gamma radiation, spore injury by, metabolic recovery of, 145
Garber, E. D., (870)
Garber, R. H., (894), 1121, (1213)
Gardner, M. W., 147
Gardner, W. S., 878
Garraway, M. O., (108), 878, 1184
Garza-Chapa, R., 879, 1260
genetics (see also **resistance**)
barley, resistance to mildew, major genes for, 683
bean, tolerance to halo blight, 681
cabbage, resistance to Rhizoctonia bottom rot, 367
Hibiscus spp., resistance to root knot, 687
lespedeza, resistance to root knot, 180
oats, resistance to Helminthosporium victoriae, victoria locus mutation, 210
Pisum sativum, resistance to bean yellow mosaic virus, 113, **116**
sweetpotato resistance to stem rot and root knot, 1217
tobacco, resistance to black shank, 678
tomato, resistance to wilt, 1301
Vicia spp. and hybrids, resistance to root knot, 102
wheat, resistance to bunt, rusts, and viruses, 664
genetics of microorganisms
Armillaria mellea, variation in culture, 1241, **1242, 1243**
Calonectria nivalis, perfect stage of Fusarium nivale, 1100
Rhizoctonia solani, single-spore isolates and heterokaryons of, 1260, **1261, 1266**
Verticillium albo-atrum, hyphal anastomosis in soil, 1110
Georgiadou, E., (230)
Georgopoulos, S. G., 230, (1330)
Geotrichum candidum
animal and plant isolates
bioassay of, 877
pathogenicity of, 901
ultrastructure studies of, 885
Geraldson, C. M., (929)
Gerdemann, J. W., (70)
germination
chlamydospores
Thielaviopsis basicola, physiology of, 337
Ustilago avenae, effect of x-rays on, 265
conidia
Erysiphe graminis tritici, 304
production of victoxinine, 53
endoconidia, Thielaviopsis basicola, physiology of, 337
Sclerotinia fructicola, inhibited by nematode-infected peas, 882
silica gel diffusion technique for determination of, **248**
sporangiospores, of Rhizopus stolonifer, electron micrographs of, 871
spore-, Rhizopus arrhizus, amino acids affecting, 118
teliospores, effect of sugars on, for Ustilago maydis, 479
uredospores of
Puccinia graminis at low spore densities, 1036
Puccinia striiformis
effect of light and temperature on, 787
at low spore densities, 1036
Uromyces phaseoli, effect of light on, 1316
Gilbertella persicaria, sporulation of, mitochondrial degeneration, 871
Gill, C. C., 369
Gillaspie, A. G., Jr., 1426
ginger, Meloidogyne incognita in, 755
Gloeosporium musarum, appressoria and conidia, response to hypochlorous acid, 1201
Glomerella
cingulata
hyphal lysis in soil, 595, **596**
response to thiram, 896
magna, influence of light on perithecial formation, 134
gluconate, catabolism of, by Pseudomonas solanacearum, 999
glucosamine, counteraction of glucose inhibition of root elongation by, 888
glucose
catabolism, by Pseudomonas solanacearum, 999
effect on infection of Gomphrena globosa by red clover vein mosaic virus, 832
metabolism by Armillaria mellea, influence of ethanol on, 878
β-glucosidase, synthesis of, by Pseudomonas syringae in tobacco leaves, 881
DL-glutamate, catabolism of, by Pseudomonas solanacearum, 999
Glycine max (see **soybeans**)
Gnomonia fructicola, production of perithecia in culture, 197
Gold, A. H., (353), (902), (904)
Gomphrena globosa
apple latent virus in, cell inclusions, 838
potato virus X
latent infection of, 431
resistance reversal of, 882
red clover vein mosaic virus on, effect of
glucose and red clover flower extract on, 832
light on lesion formation by, 364
Gooding, G. V., Jr., 1310
Goos, R. D., (1432)
Gordon, M. P., (419)
Gortz, J. H., (145)
Goss, J. A., (877)
Gossypium (see **cotton**)
Goth, R. W., (95), 442, (899)
Gottlieb, D., (459), 879, (893)
Grable, C. I., 879
Graham, S. O., (148)
Graminella nigrifrons, transmission of corn stunt virus by, 584
Granados, R. R., 584
Grand, L. F., 147
grape yellow vein virus, transmission by Xiphinema americanum, 658
grapefruit (see also **Citrus spp.**)
quantitative changes in amino acids in leaves of, infected with Radopholus similis, 261
Greeley, L. W., (1357), (1428)
Green, R. J., Jr., (1110)
Greene, G. L., 1201
Gregory, G. F., 463
grey speck, oats, seed-pelleting treatment for, 349
Gries, G. A., (907)
Griffin, G. D., 879
Grogan, R. G., (151), (658), (879), (1394), (1397)
Grosso, J. J., (466)
Groves, A. B., (583)
growth
Alternaria, Botrytis, Cladosporium, and Rhizopus, low O_2 effects on mycelia of, 1098
Aphanomyces euteiches
factors affecting, 917
peptone effects on, 907
Armillaria mellea, relation of ethanol to C and N nutrition of, 108
Botryosphaeria ribis, C and pH effects on, 876
Diaporthe phaseolorum sojae, amino acids and sugar effects on, 92
fungal-, silica gel diffusion technique for, **248**

Fusarium oxysporum tracheiphilum, CO_2 and O_2 tension effects on, 183, **184**
Helminthosporium vagans, moisture and temperature effects on, 1294
Phytophthora megasperma sojae, stimulation by bacteria, 876
Rhizopus stolonifer
relation to polygalacturonase production, 734
temperature effects on, 276
Sclerotinia trifoliorum, C effect on, 906
tobacco callus tissue, 731
Verticillium albo-atrum, effects of C, N, and pH on, 401
virus-infected tobacco tissue, 731
guar (see **Cyamopsis tetragonoloba**)
Gumpf, D. F., 879
Guthrie, J. W., 147

Haas, J. H., 879
Hagedorn, D. J., (462), (869), (881)
Halisky, P. M., 1294
Hall, D. H., (906)
Halliwell, R. S., (892)
halo blight, in bean
identification of, 147
tolerance to, **681**
Halpin, J. E., (903)
Hamilton, R. I., (879)
Hammerschlag, R. S., 880
Hampton, R. O., 65, 147, 650
Hanchey, Penelope, 880, (1178)
Hancock, J. G., 880, (885), 975, 1112
Hanks, R. W., 261, (1312)
Hansing, E. D., (877)
Hanson, E. W., (309), (795), (940), (957), (1412)
Hanway, J. J., (83)
Harder, D. E., 838
Harner, F. M., (904)
Harvey, A. E., 148, 373
haustoria
as criteria for primary infection in Erysiphe graminis, **391, 393**
fine structure of, on cucumber infected with powdery mildew, 584
Hayashi, T., 192
Hayashi, Y., (1236)
Hayman, D., 148
Heagle, A. S., 880
heat, effect on
raspberry mosaic virus complex, 556
resistance and production of phytoalexin in soybean, 70
heat predisposition, to corn rust, 510
heat therapy, translocation and protection with, 153
Heathman, E. S., (148)
Heggestad, H. E., (466)
Helminthosporium
carbonum
apple resistance to, 588
victoxinine production, 53
oryzae
kernel infection of rice, 507
kernel infection of rice, effect on quality, 1003, **1004, 1005**
sativum
barley leaves, factors associated with resistance to, 79
heat-induced susceptibility of soybeans to, 70
turcicum, airborne conidia, 949, **951**
vagans, growth, pathogenicity, and sporulation, moisture and temperature effects, 1294
victoriae
disease in, production of, with phenol extracts of diseased and normal mycelia, **1297, 1299**
effect on Avena coleoptile protoplasts, 898
hyphal lysis in soil, 595, **596**
susceptibility to, in oats, 210, **211**
victorin produced by, enhancement by phytokinins, 887
victoxinine production, 55
Helton, A. W., 933
Hemicycliophora arenaria, effect of temperature on egg hatch, egg production, and motility of, 889
Hemiptelea davidii, resistance to Ceratocystis ulmi, 881
Hendrix, F. F., Jr., (873), (895), 1229
Hendrix, J. W., 148, (149), 880, (887)
Henis, Y., (74)
Henson, L., (345), (875)
herbicides
atrazine, EPTC, and paraquat, effect on growth of Sclerotium rolfsii, 897
Rhizoctonia solani, growth affected by, 1332
Hernandez, T. P., (888), (1257)
Herndon, B. A., 187
Heterodera
glycines
maturation of females, influence of inoculum level on, 585
morphologically different isolates, variation in development of, 585
soybean resistance to, 451, **453,** 873
schachtii, sugar beet susceptibility to, influence of seedling age on, 883
tabacum
permeability of the cyst of, 906
root invasion by, reduced by cellulosic and fertilizer amendments to soil, 890
heterokaryons, of Rhizoctonia solani, behavior of, 1260
Heteromeles arbutifolia, Spilocaea ariobotryae on, 147
Heuberger, J. W., 583
Hevea brasiliensis, reaction to Dothidella ulei, **719**
Heyne, E. G., (664)
Hg(II), reaction with tobacco mosaic virus, 326
Hibben, C. R., 323, 880
Hibiscus spp., reaction to root knot nematodes, 687, **689**
cannabinus, reaction to root knot nematodes, 687
esculentus, cellular response to Meloidogyne incognita acrita, 540, **541, 543**
sabdariffa, reaction to root knot nematodes, 687
Hiebert, E., 881
Hildebrand, D. C., 365, 881, (891)
Hildebrandt, A. C., (901)
Hilty, J. W., 287
Himelick, E. B., (203)
Hine, R. B., 334
Hirai, T., 1236
Hirashima, A., (1236)
histology
carnation infected with Pseudomonas caryophylli, 154
corn kernels and seedlings infected with Cephalosporium sp. and Fusarium moniliforme, 903
cotton leaf spot, 906
creeping bentgrass, with Meloidogyne spp., 88
Lespedeza stipulacea and L. striata with Phyllachora lespedezae, **1141**
okra roots infected with Meloidogyne incognita acrita, 540
Tephrosia vogelii with Phytophthora parasitica nicotianae, 489
Zea mays with Puccinia graminis, 1305
histopathology, of root knot nematode-infected peony roots, 816
Hock, W. K., 584
Hodges, C. F., 88
Hodges, F. A., (1432)
Hodgson, W. A., 560
Hoed, J., (150)
Hoes, J. A., 881
Hoitink, H. A. J., 881, 1062
Hollis, J. P., (573), 881, (883), 1015
Hollis, W. L., (531)
Holmes, F. W., 633, 881

Holton, C. S., 265
Holtzmann, O. V., 1114
Hooker, A. L., (26), (510), 536
Hooker, W. J., (431), 882
Hopp, A. D., (870)
Hoppe, P. E., 1411
Hordeum (see also **barley**)
agriocrithon, resistance to spot blotch, 79
vulgare
infected with Erysiphe graminis, fluctuation of starch amount in, 1220
resistance to spot blotch, 79
Horn, N. L., (873)
Horner, C. E., (427)
Horsfall, J. G., 882, (1031)
Horton, J. C., (603), 908
host, role of, in development of disease symptoms, 255
host-parasite relationship
Bdellovibrio bacteriovorus and Pseudomonas fluorescens, 627
bean and Pseudomonas phaseolicola, 1062
citrus and Tylenchulus semipenetrans, scion and rootstock effects on reproduction, 438
creeping bentgrass and
Fusarium roseum, 781
root knot nematode, 88
grapefruit seedlings and Radopholus similis, 261
Lespedeza stipulacea and L. striata and Phyllachora lespedezae, 1136
okra and Meloidogyne incognita acrita, origin and development of giant cells and other pathological tissues, 540
papaya and Colletotrichum gloeosporioides, periderm formation and callose deposition, 444
pea root, to Fusarium oxysporum, 722
sugar maple and Tylenchus hexalineatus, 898
wheat and
Puccinia recondita, nutrient mobilization in leaves, 799
Puccinia striiformis, survival in host tissue, 148
Trichodorus christiei, 357
Zingiber officinale and Meloidogyne incognita, 755
host reaction
to citrus infectious variegation virus, 347, **348**
to Cladosporium fulvum, effect of mineral nutrition on, 493
Houston, B. R., (787), (1036), (1121)
Howell, R. K., 882, 1170
Hoyman, W. G., 882
Huang, C. S., 755
Huber, D. M., (147), (352), 882, 953, 1416
Huguelet, J. E., 431, 882
Hunt, Marjorie L., (145)
Hurlimann, J. H., 882
Hydrangea macrophylla, leaf spot caused by Corynespora cassiicola on, 455, **456**
3-hydroxytyramine, interaction with 3-indoleacetic acid in Fusarium wilt of banana, 245
Hymenomycetes, on northern hardwoods, decay and discoloration, 900
hypertrophy, in clubroot of cabbage, cytochemical study of, 521
hypocotyl collar rot, of Phaseolus vulgaris, 531, **534**
Hypoderma mexicanum, on Mexican pines, 903
Hypomyces solani cucurbitae, diphenyl tolerance of, dosage response relationships, 1330
Hypoxylon punctulatum, as a biological control of Ceratocystis fagacearum, 772, **773**
Hyre, R. A., 1274

Ibrahim, I. K. A., 883
Ilex spp., Phytophthora cinnamomi on, variation of pathogenicity, 585
Imam Fazli, S. F., 507, 1003
immunofluorescence, determination of TMV by, 146
indoleacetic acid
cell-free system from Pseudomonas solanacearum, synthesis by, 895
decarboxylation of, by wheat lines resistant to stem rust, 610
interaction with 3-hydroxytyramine in Fusarium wilt in banana, 245
production by Pseudomonas savastanoi and outgrowth formation in Datura, 365
induced immunity, sweetpotato to Ceratocystis fimbriata, 1066
infection
barley and wheat by Erysiphe graminis, 389
bentgrass by Pythium aphanidermatum, 149
Gomphrena globosa by red clover vein mosaic virus, effect of glucose and red clover flower extract on, 832
Meloidogyne incognita, mobilization of N and K to, 1287
Peronospora manshurica, factors associated with, 889
plant susceptibility to, with bean yellow mosaic virus, 269
rice kernel by Helminthosporium oryzae, 507
rose by Verticillium wilt, 124
wheat
altered in stem rust, 223
by flag smut, influence of soil moisture and temperature on, 98
infection pegs, Phytophthora cactorum and Pythium ultimum on peach, 46
inheritance of resistance (see **genetics** or **resistance**)
inheritance of spontaneous mutations, Victoria locus in oats, 210
inoculum, of Verticillium, increase in cotton, 590
inoculum density, measuring Rhizoctonia, methods for, 74
inoculum potential, spermosphere fungi, effect of soil fungicides on, 905
inositol, effect on growth of Phytophthora, 812
Inoue, Y., (879)
insect dissemination, Pseudomonas solanacearum, 355
insect transmission (see also **aphid(s)** and **viruses**)
corn stunt virus, by leafhoppers, 584
evaluation of plant susceptibility to bean yellow mosaic virus by aphid transmission, 269
tomato yellow leaf curl virus, 1127
wound-tumor virus, by leafhoppers, 586
insecticides, systemic-, effect of Meloidogyne hapla, potato yield, and Verticillium albo-atrum, 882
intumescences, induced by Enterobacteriaceae of human origin, 145
iodoacetamide, effect on radiation resistance in fruit spoilage fungi, 230
iodoacetic acid, effect on radiation resistance in fruit spoilage fungi, 230
Iris douglasiana, teliospores and urediospores of Puccinia iridis floridanum on, **805**
Irvine, J. E., (1426)
Itoh, T., (1236)
Izadpanah, K., 148, 458

James, R. M., (583)
Jenkins, S. F., Jr., (134), (183)
Jensen, S. G., 883
Jimenez, M. F., 883
John, V. T., 148, 502, (705)
Johnson, D. L., 148
Johnson, D. W., (894)
Johnson, L. B., 148, 799, 883, 1405
Johnston, C. O., (1143)
Jones, Barbara, (401)
Jones, J. E., (871)
Jones, J. P., 272, 883, 929
Jorgenson, E. C., 883

Kado, C. I., 149, 884, (905)
Kageneckia oblonga, Spilocaea eriobotryae on, 147

Kaiser, W. J., (545), 1290
Kajiyama, Mary, (900)
Kalmia spp., Phytophthora cinnamomi on, variation of pathogenicity, 585
Karle, H. P., 562
Kasperbauer, M. J., (1108)
Katan, J., (74)
Kato, K., 864
Katsanos, R. A., (295), 468
Keen, N. T., 603, 884, (908)
Keil, H. L., 464, 584
Kelly, C. B., (876)
Kendrick, J. B., Jr., (890)
Kennedy, B. W., (407), 884
Kennedy, Kay R., (999)
Kentucky bluegrass (see **Poa pratensis**)
kernel infection
corn by Fusarium moniliforme, 903, 983
rice by Helminthosporium oryzae, 507
Kessler, K. J., Jr., 1165
Khair, J., 346
Kienholz, O. L., (146)
Kiesling, R. L., 884
Kilgore, W. W., (893)
Kilpatrick, R. A., 884
King, S. B., 884
King, T. H., (1245)
Kirk, B. T., 885
Kirkpatrick, H. C., (838)
Kirkpatrick, J. D., 438
Klarman, W. L., 584
Klisiewicz, J. M., 1354
Klotz, L. J., (691)
Knight, C. A., (905)
Ko, W., 885
Koburger, J. A., (584)
Koepsell, P. A., (893)
Kolbezen, J., (876)
Kommedahl, T., 721, 885, (893), (983)
Kosuge, T., (873)
Kraft, J. M., 149
Kramer, C. L., 517, (872)
Krassa severa, prune dwarf virus index host, 65
Krupasagar, V., 885
Krupka, L. R., (906)
Krusberg, L. R., (1170)
Kuć, J., (187), (588)
Kucharek, T. A., 983
Kuhl, Joy L., (1418)
Kuhlman, E. G., 885
Kunkel, J. F., (83), (905)
Kuntz, J. E., (885), (892)

Lacasse, N., 885
LaChance, D., 885
lactose, storage of southern bean mosaic virus in presence of, 1327
Lactuca, sativa and serriola, colonization of and survival in, by Bremia lactucae, 856
Lacy, M. L., 427
Lai, Ming-Tan, 886
Lai, P., 213, (766)
Lang, Joan, 131, 149
Langdon, K. R., 564
Laseter, J. L., 886
Lawson, R. H., 343, 886
Leach, C. M., 149
Leach, J. G., (877)
leaf spot, on Bougainvillea caused by Cercospora bougainvilleae, 128
leafhopper
transmission of corn stunt virus, 584
wound-tumor virus in hemolymph of, 586
Leath, K. T., 570, 1305
Leben, C., 886
lemon (see also **Citrus spp.**)
Radopholus similis on, modification of growth substances by, 1312
Lenzites trabea
decay of Populus grandidentata by, relationship to N content, 1324
dikaryotic and monokaryotic isolates, decay capacities of, 870
Leopold, A. C., (799)
Leptosphaerulina trifolii, effect of light on sporulation of, 903
Lespedeza
cuneata, reaction to root knot nematodes, 180, 182
stipulacea and striata, Phyllachora lespedezae on, symptoms, 1136, **1138**
letters to the editor
absorbance vs. optical density, use of terms, 376
similarity of predisposition and therapy, 140
lettuce
apple latent virus in, cell inclusions, 838, **839, 840, 841**
corky root rot of
phytotoxic substances from decomposing lettuce residues in relation to etiology of, 1054
role of N in, 1047
effect of ozone on appearance and decay of, 586
flowering time and seed production of, effect of beet western yellows and lettuce mosaic viruses on, 842
Pythium debaryanum on, 1047
lettuce mosaic virus, on safflower, 1354, **1355**
Leucothoe spp., Phytophthora cinnamomi on, variation of pathogenicity, 585
Levi, M. P., 886, (890)
Lewis, F. H., (586)
Lewis, R. W., (856)
light, effect on
Alternaria solani, 1430
Alternaria tenuis, sporulation of, 883
Ascochyta pisi, sporulation of, 149
Glomerella magna, perithecial formation of, 134
in Gomphrena globosa by red clover vein mosaic virus, formation, 364
Leptosphaerulina trifolii, development, 903
Phoma herbarum medicaginis, conidial and pycnidial formation of, 873
Phytophthora spp.
oospore germination, 583
oospore production of, 898
Phytophthora capsici and P. palmivora, relationship to sterol in sporangia induction of, 880
Puccinia recondita, uredospore production of, 584
Uromyces phaseoli, uredospore germination, 1316
Xanthomonas cyamopsidis, reaction of guar to, 893
Lightle, P. C., 886
Lilium longiflorum
Colletotrichum lilii on, effect of temperature on development of, 1106, **1107**
curl-stripe disease of, viruslike particles associated with, 869
viruslike particles from, purification of, 874
Lilly, V. G., (422)
lima beans
overwintering of Phytophthora phaseoli on, 95
Phytophthora phaseoli colonization of, effect of temperature on, 1274
Lindberg, G. D., 1297
Linderman, R. G., 887
Ling, K. C., 1252
Litton, C. C., (678)
Littrell, R. H., 540
Liu, Kang-Chien, 149
Livne, A., (164), 170
Lloyd, A. B., 595
Lloyd, E. H., Jr., (148), 887
Lockwood, J. L., (576), (595), (873), (885)
Loebenstein, G., 512, (578)

López-Rosa, J. H., 1136
Lorbeer, J. W., 887, (887), (1020)
Lotus corniculatus (see **birdsfoot-trefoil**)
Louie, R., 887, 1020
Lovrekovich, L., 578
Lowe, S. D., (150)
Lownsberry, B. F., (151), (658)
Lucas, L. T., (134)
Luke, H. H., 210, 887, 1178
Lukens, R. J., (882), (967), 1430
Lukezic, F. L., 545, (1290)
Lumsden, R. D., 585
Lychnis chalcedonica, new host for race 1 of Fusarium oxysporum conglutinans, 525
Lycopersicon esculentum (see **tomato**)
Lyman, C. W., (898)
lysis, of fungal hyphae in soil, 595

MacDonald, D. H., (894)
Mace, M. E., 245
Macris, B., (230)
Macrophomina phaseoli
on Pinus lambertiana, temperature effect of, 61
sorghum predisposed to, role of seed production in, 876
MacWithey, H. S., 887
Maduewesi, J. N. C., 462, 1336
Mai, W. F., (1132), (1320)
Maier, C. R., 887
maize dwarf mosaic virus
on corn
biological and physical properties of, 474, **475, 476**
serological comparison of, 1422
nonlinear degradation of, 878
Malca, I., 401, 888
Malekzadeh, F., 497
Malpighia glabra, susceptibility to Cercospora bunchosiae, 1114
Malus atrosanguinea (see **apple**)
manganese, deficiency in oats, seed treatment for, 349
Mankin, C. J., (351)
Manning, W. J., 235, 585
mannose, counteraction of glucose inhibition of root elongation by, 888
Mansour, I. S., 888
Maramorosch, K., (584), (586)
Margarinomyces sp., as a cause of root and butt rot of stump sprouts of yellow poplar, 1091, **1092**
Marlatt, R. B., 856
Martin, N. E., 149
Martin, R. E., (887)
Martin, W. J., 888, 1257
Martinez, A. P., (128)
Masri, S. S., 304, 389
Mathre, D. E., 337, 888, 1155, (1204), 1213
Mathre, J. H., (150)
Matsui, C., (192)
Matsumoto, T. T., 149
Matthews, F. R., (1328)
Maxwell, D. P., 888, (905)
McBeath, D. K., (349)
McCain, A. H., 150
McCoy, Mary S., 683
McDowell, L. L., 888
McElroy, F. D., 889
McKeen, W. E., 889
McKenzie, J. R., 889
McKittrick, R. T., (856)
McMeans, J. L., 889, (1104)
McNab, J. M., 889
McOnie, K. C., 197
McWhorter, F. P., (869)
mechanical transmission (see **transmission,** mechanical-)
Medicago sativa (see **alfalfa**)
Megahed, E., 1420
Meister, C. W., 889

Meloidogyne
arenaria
sericea lespedeza, effect on, 180
Vicia spp., reaction on, 102
hapla
body wall, ultrastructure of, 883
on peony roots, histopathology of, 816
sericea lespedeza, effect on, 180
systemic insecticides on, effect of, 882
Vicia spp., reaction on, 102
incognita
cotton resistance to, 871
on cotton, effect of population on Fusarium wilt, 894
creeping bentgrass, interaction with, **90**
infection site of, mobilization of N and K to, 1287
on peony roots, histopathology of, 816
survival of, in oxygen absence, 871
sweetpotato resistance to, 1217
in tobacco, increase of cytokinin, 885
on tomato, breaking of resistance to Fusarium wilt by, 871
Vicia spp., reaction on, 102
in Zingiber officinale, 755
incognita acrita
cotton, effect on Fusarium wilt of, **320**
Hibiscus spp., reaction to, 687
okra, cellular response to, 540
sericea lespedeza, effect on, 180
soybeans, histochemistry of, 586
Vicia spp., reaction on, **103**
incognita incognita, effect on sericea lespedeza, 180
javanica
peach, effect on crown gall, 150
sericea lespedeza, effect on, 180
Vicia spp., reaction on, 102
naasi, on turf, occurrence, host range, and control, 896
Menser, H. A., Jr., 466
Mentha spp., Verticillium dahliae on roots of, 427
Menyonga, J. M., (152), 359
Menzinger, W., 889
Meredith, D. S., 949, 988
Merkle, O. G., (884)
Merrill, W., 301, 890, 1083, 1324
mesic forests, fungus spore population variation within, 875
Messieha, Mimi, (474)
metabolic inhibitors, effect on phenolic and protein biosynthesis of potato tuber discs, 894
metabolism
amino acids, Rhizopus arrhizus spore germination, 113
sugars, effect on, for Ustilago maydis, 479
3-methyl-6-methoxy-8-hydroxy-3,4-dihydroisocoumarin, role in carrot root resistance to Thielaviopsis basicola and Ceratocystis fimbriata, 187
Meyer, W. L., (879)
Milbrath, J. A., 150
Millar, R. L., (1040)
Millecan, A. A., (150)
Miller, C. R., 46, (883)
Miller, J. W., 718
Miller, L. I., 585
Miller, L. P., 890
Miller, P. M., 890, (906), 967
Miller, T., 1326
Millikan, D. F., 890
Milne, R. G., 890
Mink, G. I., 645, (901)
Minton, E. B., (319)
Minton, N. A., 102, 180, 319
Mircetich, S. M., (710), 890, 1076
Mirocha, C. J., (860), (897), (899), 1220
Mishanec, W., (113)
Mitchell, J. E., (907), 917, (923)
Mitra, G. N., (485)

moisture, effect on growth, sporulation, and pathogenicity of Helminthosporium vagans, 1294
moisture content, invasion of
rice by fungi between 13.5 and 15.5%, 1162
soybeans by storage fungi, 412
Moje, W., (401)
Moller, W. J., 891
Monilinia spp., on peaches, effect of ozone on, 586
fructicola
effect of 2-aminobutane on, 876
effect of SPCP and DMSO mixture on, 874
sporulation, biochemical factors affecting, 877
Moore, D. M., (584)
Moore, J. N., (637)
Moore, L. D., (876), 891
Moore, L. W., 891
Moore, M. B., (880), 891
Morea iridioides, new host for Puccinia iridis, 804
Morgan, F. L., 891
Morgan, W. C., (896)
Morrison, L. S., (1217)
Morton, D. J., 1194
Moseman, J. G., 1357, 1428
Mount, M. S., 891
Mucor spp., on alfalfa, effect of frequency of cutting, leaf infection, and K on, 1040
ramannianus, hyphal lysis in soil, 595
Mucorales, sporulation, mitochondrial degeneration, 871
Mumford, D. L., 79
Munro, J., (560)
Murakishi, H. H., 892
Murphy, H. C., (210), (900)
Musa (see also **banana**)
acuminata, crown rot of, aerobiology of Fusarium roseum 'Gibbosum' associated with, 545
muskmelon, effect of high temperature on mosaic symptoms of, 146
Musselman, J. R., (883)
Mwanza, N. P., 892
mycolysis, by soil, relationship to autolysis, 595
Myzus persicae
beet yellows virus transmission by, inhibition by mineral oil, 1210
stylet probing by, for virus acquisition, 870
transmission of
alfalfa mosaic virus by, 1028
bean common mosaic virus, effect of probing behavior and starvation on, 1079
cucumber mosaic virus, 1028, 1420

Nair, V. M. G., 892
1-naphthol, effect on radiation resistance in fruit spoilage fungi, 230
Narain, A., 1225
Nasuno, S., 1414
Neely, D., 203
Nelson, E. E., 892
Nelson, P. E., 154
Nelson, R. R., (53)
nematocides, containing halogenated hydrocarbons, deactivation of sodium N-methyldithiocarbamate in soil, 967
nematodes (see also under genera of)
cellular response of okra to Meloidogyne incognita acrita, 540
cholinesterases of, inhibition by nematocidal carbamates, 902
host-parasite relationships of Meloidogyne incognita in Zingiber officinale, 755
inoculum level of, effect on maturation of females, 585
killing of, by n-butyric and propionic acids formed in flooded soil, 1015
parasitic habits on wheat, **357**
parasitism of Trichodorus christiei, 573
quantitative changes of amino acids in grapefruit seedlings infected by, 261
reaction to soil fumigants, 691
reaction on Vicia spp. and F_5 hybrids from interspecific crosses, 102
reproduction on four reciprocally grafted hosts, 438
root knot-, interaction with creeping bentgrass, **90**
soybeans
histochemistry of, 586
resistance to, 451
transmission of viruses, 658
uptake of ethylene dibromide by, 888
Nephotettix impicticeps, nonpersistence of tungro virus of rice in, 1252
Nevins, D. J., 892
new diseases, species, and varieties
apple, virus on, **363**
Dothiorella canker, of almond trees in California, 146
Fusarium blight of turfgrasses, 781
peanut root necrosis, 1361, **1362**
Phomopsis loti sp. n., on birdsfoot-trefoil, 760
stem canker and blight on soybean and birdsfoot-trefoil caused by Diaporthe phaseolorum sojae, 396
strawberry pseudo mild yellow edge virus, **571**
stunt, new virus disease of peanuts, 587
virus disease on beans, 901
Nichols, C. W., 150
Nicotiana (see also **tobacco**)
glutinosa
cytological abnormalities in, induced by high temperature, 705, **706, 707, 708**
electron microscopy of dark green spots on leaves of, by tobacco mosaic virus, 192, **193, 194, 195**
temperature-induced viruslike symptoms in, 148, 502, **503**
tabacum
alfalfa mosaic virus inclusions in, 875
growth of virus-infected tissues of, 731
tobacco mosaic virus in, disease development, 892
tobacco ringspot virus in, effect of red light on content of, 1108
tabacum var. Xanthi-nc, tobacco mosaic virus in, effect of temperature on, 873
nicotinic acid, effect on growth of Phytophthora, 812
Nielsen, L. W., (878)
Nigh, E. L., Jr., 150
Nilan, R. A., (265)
Nims, R. C., 892
Nishimura, S., 53
nitrogen
amount in Clitocybe tabescens, Fomes spp., and Polyporus versicolor, 1083
changes in concentrations of, Ditylenchus dipsaci on alfalfa and pea, 1170
control of Sclerotinia homeocarpa, 877
effect on
growth of Sclerotium rolfsii and Trichoderma viride in atrazine-treated soil, 874
potato scab, 152
reaction of guar to Xanthomonas cyamopsidis, 893
liquid-, system for rust-spore storage, 570
mobilization to infection site of Meloidogyne incognita, 1287
role in
corky root rot of lettuce, 1047, **1051**
wood deterioration, 1083
Nitzany, F. E., (1127), 1386
Norton, D. C., 769
nucleic acids (see also **ribonucleic acid**)
in Nicotiana glutinosa, effect of temperature on, 502
in oats, changes induced by victorin, 906
nucleotides, free-, in southern bean mosaic virus-infected bean leaves, 871
nutrition
antitumor compounds, effect on crown gall, 131

C source
Aphanomyces euteiches, 917
Armillaria mellea, 108
Botryosphaeria ribis, 876
Diaporthe phaseolorum, 92
Erwinia amylovora, effect on growth, 845
Sclerotinia trifoliorum, 906
Sclerotium rolfsii and Trichoderma viride in atrazine-treated soil, 874
Thielaviopsis basicola, spore germination of, 337
Ustilago maydis, teliospore germination, 479
Verticillium albo-atrum, 401, 964
C-N ratio, effect on cellulase synthesis in cellulolytic fungi, 886
fungal spore-, relation to soil fungistasis, 885
mineral-
Aphanomyces euteiches spore formation, 919
host reaction to Cladosporium fulvum, 493
nematode reproduction, affected by, 1024
N source
Armillaria mellea, 108, **109**
Diaporthe phaseolorum, growth, 92
effect on host reaction to Cladosporium fulvum, 493
Erwinia amylovora, effect on growth, 845
Rhizopus arrhizus, 118
Verticillium albo-atrum, 401, 965
P and K, effect on host reaction to Cladosporium fulvum, 493
respiratory substrates, Verticillium albo-atrum, 964
vitamin effects on, in Erwinia amylovora, 845
Nwauzo, E. E., (1336)
Nyland, G., 150, (152)
Nyvall, R., 893

oak, Ceratocystis fagacearum on
Hypoxylon punctulatum as a control of, 772, **773**
resistance to, relation of auxin to double band formation in, 885
oats
absorption and translocation of S^{35} in, **272, 273**
grey speck of, seed-pelleting treatment for, 349, **350**
kernel weight, relationship to crown rust, 39
mature tissue of, resistance to Puccinia coronata, effect of temperature on, 874
planting date, relationship to
crown rust, 41
kernel weight, 42
Puccinia graminis on starch fluctuation in, 1120
resistance to
crown rust, 880
relation to kernel weight, 39
use of buckthorn, 891
response to Puccinia coronata in Brazil, 900
toxin, from Helminthosporium victoriae, 53, 898
victorin
enzyme localization and nucleic acid content, changes induced by, 906
respiration induced by, effect of leaching on, 1196
symptoms induced by, suppression of Ca, 875
ultrastructure affected by
in leaf tissue, 1178, **1181**
in root tissue, 880, 1178, **1179, 1180**
obituaries
Jacquelin S. Cooley, 1883-1965, 473
Ancell Byron Groves, 1904-1966, 993
C. O. Johnston, 1893-1965, 1119
Ernest A. Lungren, 1899-1965, 994
Christos Plutarch Sideris, 1891-1965, 379
Ernest M. Stoddard, 1889-1965, 253
Obrig, T. G., 893
Ocana, G., 893
Ogawa, J. M., 150, (874), 893
oil sprays, field tests of, for prevention of cucumber mosaic virus, 512
okra (see **Hibiscus spp.**)
oleoresins, influence on Fomes annosus, 870

Olpidium brassicae, relationship between zoospores and TNV, 146
onion
onion yellow dwarf virus in, mechanical transmission of, 1020
Pyrenochaeta terrestris on, sugar repression of cellulase synthesis and endopolygalacturonase as mechanisms of resistance to, 908
onion smut, survival of teliospores and mycelia in soil, 136
onion yellow dwarf virus
epiphytology of, 887
mechanical transmission of, 1020
oospores
Phytophthora cinnamomi, production of, in avocado roots and soil, 1076, **1077**
Phytophthora phaseoli on lima bean, overwintering units of, **96**
Phytophthora spp., effect of light on germination of, 583
orange (see also **Citrus spp.**)
Radopholus similis, modification of growth substances, 1312
Orellana, R. G., 893
Orenski, S. W., (586)
Orlob, G. B., (1028)
Oro, J., (886)
O'Rourke, C. J., 1040
Oryza sativa (see **rice**)
Ostazeski, S. A., 585
Overman, A. J., (929)
Owen, J. H., (1229)
Oxalis corniculata, culture of Puccinia sorghi on detached leaves of, 536
oxidases (see **enzymes,** specific)
oxygen, effect of
concentration on Pythium seed rot of soybean, 407
Meloidogyne incognita survival, 871
oxygen consumption, Puccinia graminis tritici, determination of, 872
oxygen tension, Fusarium oxysporum tracheiphilum growth, 183
ozone
Alternaria solani conidiophores injured by, 896
amino acid changes in leaves caused by, 904
fungi spore sensitivity to, 880
needle mottle of pine caused by, 897
ozone fleck, on tobacco leaves, prevention by C filter, **466**

Pady, S. M., (517)
Palmer, J. G., (899), 1277, 1283
Papavizas, G. C., (1006), 1071, 1269
papaya
periderm formation and callose deposition, 151, **447, 448**
residue, manometric studies of colonization in soil by Pythium aphanidermatum and Phytophthora parasitica, 334
resistance to anthracnose, 151, 444
Pappelis, A. J., 295, (468), 829, 850
paraquat, effect on growth of Rhizoctonia solani, 1332
parasitic habit, Trichodorus christiei on wheat, 357
parasitism
Fusarium oxysporum, a quasi-parasite of bean pods, 442
of Trichodorus christiei, 573
Parmeter, J. R., Jr., (874)
Patel, K. P., 894
Patel, P. N., 681
pathogenicity
Erysiphe polygoni on legumes, 309
Meloidogyne spp. on creeping bentgrass, 88
Phytophthora cinnamomi, variation of, on evergreens, 585

Pratylenchus penetrans on grasses, 995
Tylenchorhynchus claytoni on grasses, 995
Patil, S. S., 894, 971
Patton, R. F., 894, (1116)
Paxman, G. A., 894
PCNB, degradation of, by Streptomyces venezuelae and Trichoderma viride, 873
pea
Aphanomyces on
relationship of Pythium spp. to, 869
suppression by cruciferous soil amendments, 1071
Ditylenchus dipsaci on
changes in amino acid and N concentrations, 1170
inhibition of spore germination by, 882
Erysiphe polygoni on, morphology and pathogenicity of isolates, 309
Fusarium oxysporum pisi on, effect of root exudates on spore germination of, 721
inheritance of resistance to BV2, temperature effect on, 113
Pseudomonas syringae on, 881
pea enation mosaic virus
Galactia sp. as a local lesion host for, 458
nucleic acid, isolation and properties of, 900
protein, isolation and properties of, 900
purification and serology of, 148
pea streak virus (see **Wisconsin pea streak virus**)
peach (see also **Prunus spp.**)
brown rot of, relation of cooling methods and ozone to, 586
crown gall, affected by root rot nematode, 150
peach tree decline, Pythium spp. associated with, **1231**
Pseudomonas syringae on, 989
Pythium irregulare and P. vexans on, effect of temperature, 895
Pythium ultimum and Phytophthora cactorum on, relation to soil fungi, 46
Rhizopus stolonifer on, effect of temperature on growth of, 276
seedling cankers, induced by chilling, 146
peach tree decline
feeder root absence associated with, **1230**
relation to Pythium spp., 1229, **1231**
peach yellow bud mosaic virus
inability to move into opposite noninoculated primary leaves of cowpea, **562**
transmission by Xiphinema americanum, 658
peanut
Calonectria on, new disease, 1361, **1362**
fungi isolated from, influence of fungicides and landplaster on, 905
stunt, new virus disease, 587
peanut stunt virus, physical properties, purification, and serology of, 904
pear
extracts of, effect on perithecial production in Gnomonia fructicola, 197
fire blight on
epidemiology of, 464
seedling susceptibility, 145
pear decline virus on, terminal growth affected by, 150
pear psylla virus, spread in California, 150
virus-infected tissues, effect of extracts from, on pathogenic fungi, 176
pectic enzymes (see **enzymes,** specific)
pectic substances
degradation of, by Sclerotinia sclerotiorum in sunflower and tomato, 975
water-insoluble-, in safflower in relation to resistance to Phytophthora drechsleri, 985
Peet, C. E., (1102)
Pegg, G. F., 894
Pelletier, R. L., (1062), (1184)
penetration, of Verticillium albo-atrum in cotton, 1121
Penicillium spp.
on alfalfa, effect of frequency of cutting, leaf infection, and K on, 1040
survival affected by establishment in host tissues, 766, **768**
wood colonized by, 301
digitatum, effect of 2-aminobutane on, 876
expansum
effect of 2-aminobutane on, 876
resistance to sodium dehydroacetate and ortho-phenylphenate, 870
frequentans, hyphal lysis in soil, 595
pentachloronitrobenzene, gas-phase chromatographic method for determining minute concentrations of, 887
Pentatrichopus jacobi (see also **aphid(s)**)
transmission of strawberry pseudo mild yellow edge virus by, 571
peony, root knot nematodes on, histopathology of, 816, **817, 818, 819**
Pepin, H. S., 361
pepper
excised leaves of, bacterial spot development, effect of temperature on, 1194
resistant-, lesion development and multiplication of, by Xanthomonas vesicatoria in, 1152
tobacco rattle virus on, properties and purification of, 1190
peptone, components of, effect on differentiation and growth of Aphanomyces euteiches, 907
Perdomo, R., (878)
Periconia circinata, toxin A, crystallization of, 1149
periderm, formation of, in relation to anthracnose resistance in papaya fruit, 151
perithecia
Glomerella magna, influence of light on formation of, 134
Gnomonia fructicola production by, in culture, 197, **198, 199**
Peronospora manshurica, in soybean
factors associated with infection and sporulation of, 889
physiological changes in infection and resistance, 890
Peronosporales, deposition and function of callose in, 145
peroxidase (see **enzymes,** specific)
Perry, V. G., (357)
pesticides, degradation of, by microorganisms, 873
Petersen, D. H., (46), (989)
Peterson, G. A., (884)
Peterson, G. W., 894
Peterson, J. L., (584)
Petr, F. C., (210)
pH, effect on
growth of
Botryosphaeria ribis, 876
Verticillium albo-atrum, 401
pectate lyase production by Colletotrichum trifolii, 1112
phase-contrast microscopy, study of asexual nuclear division with, 869
Phaseolus spp. (see also **bean**)
aureus, Rhizoctonia solani, cell permeability increase, 885
vulgaris
Fusarium oxysporum on, 442
Fusarium root rot of, importance of lateral roots in, 292
halo blight on, inheritance of tolerance to, **681**
hypocotyl collar rot of, incidence of, 531
southern bean mosaic virus in, change in peroxidase by, 669
Uromyces phaseoli typica on, fluctuation of starch amount in, 1220
xanthomonads on, symptoms of, 58
Phelps, R., 895
Phoma sp., effect of extracts from virus-infected apple and pear tissues on, 176

destructiva, on tomato, effect of fumigants on, 929
herbarum medicaginis, effect of light and temperature on conidia and pycnidial formation of, 873
Phomopsis loti
on Lotus corniculatus, disease development by, 791
sp. n., 760, **762**
phosphorus, toxicity in soybeans, Bacillus subtilis associated with, 83
phosphorus-32, change in, soybean leaves infected by Cercospora sojina, **987**
phototropism, by conidiophores of Cercospora beticola, 702, **703**
Phyllachora lespedezae, on Lespedeza stipulacea and L. striata, symptoms, 1136, **1138**
Phymatotrichum omnivorum
induction of sporulation, 907
translocation of P^{32} into sclerotia, 903
physiology of microorganisms
Agrobacterium tumefaciens, antitumor activity of compounds to, 131
Aphanomyces euteiches, growth factors, 917
Aspergillus niger, pectin lyase and polygalacturonase produced by, 279
Botrytis cinerea, pectin lyase and polygalacturonase produced by, 279
Colletotrichum trifolii, pectate lyase production by, 1112
Diaporthe phaseolorum sojae, 92
Erwinia amylovora, nutritional requirements of, 845
Erysiphe cichoracearum and E. graminis, water content vs. germinability of conidia, 1031
Fusarium oxysporum
O_2 and CO_2 tensions, 183
pectin lyase and polygalacturonase produced by, 279
polygalacturonate trans-eliminase from, 1269
Fusarium solani
degradation of pectic substances in, 238
polygalacturonate trans-eliminase from, 1269
Gnomonia fructicola, perithecial production in, 197
Helminthosporium spp., victoxinine production by, 53
Phytophthora spp.
effect of vitamins on growth on 17 spp., 812
protein content in spp., 1334
Pseudomonas marginalis, pectic enzymes of, 1414
Pseudomonas solanacearum, carbohydrate catabolism of, 999
Puccinia graminis tritici, CO_2 fixation, 164
Puccinia sorghi, detached leaf culture, 536
Pyrenochaeta terrestris, polygalacturonase produced by, in culture and on host, 603, 908
Pyricularia oryzae, effect of phenol metabolism compounds on sporulation, 865
Pythium ultimum, growth in varying O_2 concentrations, 407, **410**
Rhizoctonia solani
growth affected by herbicides, 1332
pectin lyase and polygalacturonase produced by, 279, 1006
Rhizopus arrhizus, role of proline and glutamic acid metabolism in, 118
Rhizopus stolonifer
polygalacturonase produced by, 279, 734
temperature effects, 276
Sclerotium rolfsii, polygalacturonase produced by, 279
Thielaviopsis basicola, spore germination of, 337
tree wilt fungi, growth and sporulation in xylem extracts of, 1165
Uromyces phaseoli typica, translocation patterns in, 170
Ustilago avenae and U. kolleri, amino acids and sugars in teliospores of, 1225
Ustilago maydis, teliospore germination, 479
Verticillium albo-atrum
growth of, 401
respiration of conidia from, 963
phytoactin
stability under sonification, 151
translocation and persistence in Pinus albicaulis, 147
translocation in western white pine seedlings, 373
phytoalexin, production in soybeans reduced by heat, 70
phytokinins, enhancement of victorin effects by, 887
Phytophthora spp.
amino acids, role in chemotaxis of zoospores, 907
callose deposition and function, 145
effect of vitamins on growth of, 812
in forest soils, 872
isolation from soil, selective media for, 893
oospore production, effect of light on, 898
response to antibiotics in pimaricin-vancomycin medium, 152
cactorum
antigenicity of mycelium, factors affecting, 422
effect of light on oospore germination of, 583
heat-induced susceptibility of soybean to, **72**
on young roots of peach, 46
capsici, light and sterol in sporangia induction, 880
cinnamomi
antigenicity of mycelium, factors affecting, 422, **425**
chlamydospore germination, physiology of, 890
on evergreens, pathogenicity of, 585
persistence in soil, 710
production of chlamydospores and oospores in avocado roots and soil, 1076
soil bacterium effects on sporangial production, 235
starch gel electrophoresis of proteins of, 1334
citrophthora
reaction to soil fumigants, 691
starch gel electrophoresis of proteins of, 1334
drechsleri, on safflower, relation of Ca and pectic substances in resistance to, 985
erythroseptica
antigenicity of mycelium, factors affecting, 422
effect of light on oospore germination of, 583
fragariae
on Geum and Potentilla spp., susceptibility of, 637
reaction of strawberry clones and cultivars to, 361
heveae, effect of light on oospore germination of, 583
infestans
effect of light on oospore germination of, 583
on potato
C^{14} distribution in relation to, 1184
inhibition of potato virus X by, 560
megasperma
alfalfa reaction to, 653
oospore germination of, 653, **656**
variation in virulence of, 653, **656**
megasperma var. sojae
effect of light on oospore germination of, 583
electrophoretic comparisons of soybean leaf proteins from varieties resistant to, 287
growth of, stimulation by Bacillus subtilis, 876
heat-induced susceptibility of soybean to, 70
physiological races of, distribution, 891
on soybean, cross-protection by inoculation with Phytophthora cactorum, 894
palmivora
effect of light on oospore germination of, 583
light and sterol in sporangial induction, 880
manometric studies on residue colonization in soil by, 334
starch gel electrophoresis of proteins of, 1334
parasitica
manometric studies on residue colonization in soil by, 334
production of zoospores by, 359
reaction to soil fumigants, 691

parasitica var. nicotianae
sporangial production by, in tobacco rhizosphere and in soil, 587
on Tephrosia vogelii, histology studies of, 489
tobacco resistance to, 678, **679**
phaseoli
on lima bean, effect of temperature on, 1274
overwintering of, **96**
phytotoxicity, of crop residues, 146
Pieris sp., Phytophthora cinnamomi on, variation of pathogenicity, 585
Pierson, C. F., 276
pine
ozone needle mottle of, 897
root oleoresins of, influence of Fomes annosus, 870
Pine, T. S., 150
Pinus spp., Phytophthora cinnamomi on, variation of pathogenicity, 585
albicaulis, translocation and persistence of phytoactin in, 148
elliottii, colonization of, by Fomes annosus, factors, 897
lambertiana, charcoal rot disease of, 61
monticola, translocation of phytoactin in seedlings of, 373
nigra, infection and penetration of, by Dothistroma pini, 894
palustris, brown spot of, caused by Scirrhia acicola, 720
ponderosa
colonization by soil fungi, 301
Fomes annosus on, 874
infection and penetration of, by Dothistroma pini, 894
ponderosa var. scopulorum, dwarf mistletoe on, reduction of basal area growth by, 886
strobus, penetration by Cronartium ribicola labeled with fluorescent brightener, 894
virginiana, disease resistance in, 584
Pirone, T. P., 371, (493), (584), (870), (1420)
Pisum sativum (see **pea**)
plant injury, effect of senescence of sorghum stalk tissue, 295
planting date, effect on cell death and stalk rot in corn, 829
Plasmodiophora brassicae
on cabbage
cytochemical study of hypertrophy caused by, 521
monoxenic culture of, 903
race determination of, 624
ultrastructural studies of, 907
plum (see also **Prunus spp.**)
black knot on, factors involved in outbreaks of, 586
Poa pratensis, pathogenicity of
Helminthosporium vagans on, effect of moisture and temperature on, 1294
Pratylenchus and Tylenchorhynchus on, 995
pod and stem blight of soybean, effect of amino acids and sugars on, 92
polygalacturonase (see **enzymes,** specific)
polygalacturonate trans-eliminase (see **enzymes,** specific)
Polyporus versicolor
amount of N in mycelium of, 1083
decay of Populus grandidentata by, relationship to N content, 1324
growth of, on N compounds, 890
polysaccharides, specificity in plant cell walls, 892
Polzin, W. J., (583)
ponderosa pine (see **Pinus spp.**)
Pool, R. A. F., 895
Populus grandidentata, N content in relation to decay by Lenzites trabea and Polyporus versicolor, 1324
Poria weirii, in buried Douglas-fir cubes, survival of, 892
Porter, F. M., 1424
potassium
injury to chrysanthemum cuttings, excess of, 713, **715**
mobilization to infection site of Meloidogyne incognita, 1287
potato
Phytophthora infestans on
distribution of C^{14} in relation to, 1184, **1187, 1188**
inhibition of potato virus X, 560, **561**
potato virus X in, effect of temperature on, 882
Verticillium albo-atrum on, synthesis of chlorogenic acid in plants resistant to, 971
yield, effect of systemic insecticides on, 882
potato scab, influence of N on, 152
potato spindle tuber virus, electron microscopy and purification of, 901
potato virus X
on Gomphrena globosa
latent infection in, 431
resistance to, 882
inhibitor of, in potatoes infected with Phytophthora infestans, 560
in potato and leaves, temperature effect on, 882
potato virus Y
on Capsicum annuum, resistance to, 1370
on Chenopodium quinoa, local lesion host for, **1394**
purification of, 587, 1397, **1402**
Potentilla glandulosa, susceptibility to Phytophthora fragariae, 637
Pound, G. S., (898)
powdery mildew, germination of conidia, formation of appressoria and secondary hyphae in, 304
Powell, W. M., 895, (1229)
Powelson, R. L., 248, 895, (1314)
Pratt, M. J., 895
Pratylenchus penetrans
on creeping red fescue, **996**
pathogenicity on three grasses, 995
penetration of alfalfa roots by, effect of fungal enzymes, Fusarium, and Trichoderma on, 1132
population increase on alfalfa and celery, 1320
Prescott, J. M., 895
Presley, J. T., 375, (899)
Pring, D. R., 896
Pringle, R. B., 1149
propionic acid, formation of, in flooded soils, killing of nematodes by, 1015
protease (see **enzymes,** specific)
proteins
in barley infected with Erysiphe graminis, changes of, 149
of barley stripe mosaic virus, serology of, 879
soybean leaf, from varieties resistant to Phytophthora megasperma sojae, electrophoretic comparisons of, 287
protocatechuic acid, from Uromyces phaseoli typica, identification and isolation of, 880
Provvidenti, R., (113)
prune dwarf virus, failure to detect by bud indexing, 650
Prunus spp. (see also **apricot, cherry, peach,** and **plum**)
cucumber mosaic virus on, serological identification of, 152
avium, boron deficiency involved with a virus, 150
cerasus, similar symptoms caused by cherry rugose mosaic, recurrent ringspot, and sour cherry yellows viruses, 150
domestica
black knot on, factors involved in outbreaks of, 586
translocation of fungicides in, 933
effusa, prune dwarf virus index host, **67**
persica, Phytophthora cactorum and Pythium ultimum on, mode of penetration of, 46
serotina, growth of Ceratocystis fagacearum, C. ulmi, Fusarium oxysporum, and Verticillium albo-atrum on xylem sap of, 1165
Prunus ringspot virus, symptoms in rose resemble typical rose mosaic, 152

Pseudomonas spp.
effect on sporangial production in Phytophthora cinnamomi in liquid, 235
systemic infection of fruit trees by, 872
atrofaciens, bacteriophages of, in cereal seeds, 727
caryophylli, on carnation, histology in infected tissue, 154, **157, 158, 159, 160, 161**
fluorescens, formation of outgrowth on Datura, **365**
glycinea, survival after alternate freezing and thawing, 903
lachrymans, protease of, relation to cucumber angular leaf spot, 884
marginalis, pectic enzymes of, 1414
phaseolicola
on bean
identification of, 147
inheritance of tolerance to, **681**
toxemia of, 1062
electron microscopy of, 891
savastanoi, formation of outgrowths on Datura and indoleacetic acid production, 365
solanacearum
avirulent strains, antagonism to virulent strains, 869
catabolism of DL-glutamate, gluconate, and glucose by, 999
cell-free system of, indoleacetic acid synthesis by, 895
insect dissemination of, 355
on tobacco, stimulation of aromatic biosynthesis by, 894
on tomato, effect of fumigants on, 929
syringae
bean, 881
on Datura, formation of outgrowth, 365
β-glucosidase synthesis of, 881
on pea, 881
on peach, 989
tabaci, survival after alternate freezing and thawing, 903
Pseudoperonospora
cubensis, tissues diseased by, selective accumulation of water in, 152
humuli, sporulation on hop leaves lacking stomata, 150
Puccinia
coronata
isolation of single spores, 346
response of oat varieties to, in Brazil, 900
coronata f. sp. avenae
absorption and translocation of S^{35} in oats inoculated with, 272
oat tolerance to, effect of planting date on, 41
oat varieties, resistance to, 36
production of ninhydrin-positive material by, 883
resistance of mature oat tissue to, effect of temperature on, 874
graminis
germination of uredospores at low spore densities, 1036
resistance of Zea mays to, 1305
spore trapping correlated with rust on wheat, 1376
spores in rain, 807
system for storing spores in liquid N, 570
graminis f. sp. avenae
on Avena sativa, fluctuation of starch amount caused by, 1220
dark fixation of CO_2 by "malic enzyme" of, 897
graminis f. sp. tritici
growth in vitro, **1418**
haustoria, association of host endoplasmic reticulum, 876
infection processes and aggressiveness altered by, 223
urediospores
O_2 consumption, determination of, 872
survival in media, 1432
on wheat foliage, effect of temperature on survival of, 902
on wheat, breeding for resistance to, 664
wheat lines resistant to, decarboxylation of indoleacetic acid by, 610
iridis f. sp. floridanum form, nov., **804**
recondita
effect of light and temperature on uredospore production of, 584
nutrient mobilization in leaves by, 799
spore trapping correlated with rust on wheat, 1376
spores in rain, 807
on wheat
breeding for resistance to, 664
change in nucleotide composition of RNA induced in, 883
recondita f. sp. tritici, methods of analysis of field collections, comparison, 1143
sorghi
culture of, on detached leaves of corn and oxalis, 536
heat predisposition to, 510
striiformis
effect of low temperature on survival of, 148
germination affected by
light and temperature, 787
low spore densities, 1036
on wheat
effect on root development, 149
invasion by microorganisms and survival of, 887
pumpkin mosaic virus, biochemical and biophysical properties of, host range, 877
Purdy, L. H., 98, 896
pycnidial production, by Septoria nodorum, on dead wheat tissue, 580
Pyeatt, L. E., (896)
Pyott, Joanna, (248)
Pyrenochaeta terrestris
on onion, sugar repression of cellulase synthesis and endopolygalacturonase as mechanisms of resistance to, 908
polygalacturonase of, 603
Pyricularia oryzae, sporulation of, factors affecting, 864
pyridoxine, effect on growth of Phytophthora, 812
Pythium spp.
associated with peach tree decline of peach seedlings, **1231**
on cotton, control of, by fungicides, 871
in forest soils, 872
relationship to Aphanomyces root rot, 869
seed rot of soybean, effect of O_2 concentration on, 407, **410**
viability after 12 years in air-dried muck soil, 1411
aphanidermatum
bentgrass infection by zoospores, 149
manometric studies on residue colonization in soil by, 334
debaryanum
on lettuce, 1047
resistance in Virginia pine to, 584
dissotocum, relation to peach tree decline, 1229
irregulare
on peach, effect of temperature, 895
relation to peach tree decline, 1229
ultimum
inhibitor of, in nursery soils, 905
relationship to clover seed concentration in soil, 879
synergism with cucumber mosaic virus, 1386
on young roots of peach, 46
vexans
on peach, effect of temperature, 895
on peach seedlings, association with peach tree decline, 1229, **1231**

Raabe, R. D., 124, (147), 713, (882), 1241

Radewald, J. D., 896
radish
carbohydrate level, photosynthesis, and translocation of, affected by Albugo candida, 898
common hosts for wilt Fusarium from, 525
Radopholus similis
in grapefruit seedlings, quantitative changes of amino acids, 261
in lemon and orange, modification of growth substances by, 1312
Rai, P. V., 896, 1365
raisins, microflora of, 1413
Rao, A. S., 896
raspberry (see also **Rubus spp.**)
aphid-borne viruses, mechanical transmission of, 1245
raspberry mosaic virus on, effect of heat treatment, 556
ratoon stunting disease virus
assay and purification, 1426
sugarcane seed transmission, 878
Ravenscroft, A. V., (337), (888), (1213)
recurrent ringspot virus, on Prunus cerasus, similar symptoms to cherry rugose mosaic and sour cherry yellows viruses, 150
red clover (see also **Trifolium pratense**)
bean yellow mosaic virus on
field spread of, 147
self-fertile homozygous necrotic with, 345
Erysiphe polygoni, resistance to, 875
Fusarium spp. isolation from roots of, use of azide-rose bengal medium for, 584
red clover vein mosaic virus
on Gomphrena globosa, effect of
glucose and red clover flower extract, 832
light on lesion formation by, 364
Reddi, G. S., (896)
Redit, W. H., (586)
redwood, invasion of, by Fomes annosus, 874
Reinert, R. A., 731, 1108
relative humidity, effect on germination, mycelial growth, and sporulation of Erysiphe polygoni on red clover, 940
residues, phytotoxic substances from, relation to etiology of corky root rot of lettuce, 1054, **1058**
resistance (see also **tolerance**)
apple to
Helminthosporium carbonum, 588
Venturia inaequalis, 588
barley to
covered smut, interpretation of partially smutted plants, 884
powdery mildew, major genes for, 683
spot blotch, 79
cabbage to Rhizoctonia, 367
carrot to Ceratocystis fimbriata and Thielaviopsis basicola, role of MMHD, 187
Fragaria chiloensis to Verticillium wilt in California, 219
fruit spoilage fungi to radiation, 230
Gomphrena globosa to potato virus X, reversal of, 882
Hemiptelea davidii to Ceratocystis ulmi, 881
mature oat tissue to Puccinia coronata avenae, 874
oak to Ceratocystis fagacearum, relation of auxin to double band formation, 885
oats to crown rust, 880
oats to crown rust, use of buckthorn, 891
onion to Pyrenochaeta terrestris, sugar repression of cellulase synthesis and endopolygalacturonase as mechanisms of, 908
Penicillium expansum to sodium dehydroacetate and ortho-phenyl-phenate, 870
red clover to Erysiphe polygoni, 875
rice to seedling blight, effect of soil temperature on, 640
safflower to Phytophthora drechsleri, 985
soybeans to
Helminthosporium sativum, broken by heat, 70
Heterodera glycines, 451, 873
Phytophthora cactorum and P. megasperma, broken by heat, 70, **72**
sunflower to Verticillium albo-atrum, screening for, 881
sweetpotato to
Ceratocystis fimbriata, 888, 1066
Fusarium oxysporum f. batatas, 888, 1217
major diseases, 888
Meloidogyne incognita, 888, 1217
tobacco to
Phytophthora parasitica, 678
virus, 904
tomato to
Fusarium oxysporum f. lycopersici, 1301
Fusarium wilt, breaking by Meloidogyne incognita, 871
tobacco mosaic virus, 869
Trifolium pratense to Erysiphe polygoni, 957
wheat to
bunt, 664
leaf rust, 664
Septoria tritici, 897
stem rust, 664
wheat mosaic virus, 664
wheat streak mosaic virus, 664
Zea mays to Puccinia graminis, histology of, 1305
respiration, endoconidia, affected by cotton root extract, 337
Reyes, A. A., (871), 896
Rhizoctonia spp.
biological control by bacteria, 953, **954**
evaluating inoculum density of, 74
inhibition of, in nursery soils, 905
solani
auxin production by, 875
on bean
cell permeability increase, 885
changes in oxidase in extracts from, relation to lesion maturation, 888
respiratory pattern of, in relation to lesion maturation in hypocotyls, 870
in cabbage, resistance to, 367
on cotton, control of, by fungicides, 871
cultural characteristics, **1261**
enzyme production by, 279
from flax, heterokaryons and single-basidiospore isolates of, behavior, 1260
growth affected by atrazine, diuron, EPTC, and paraquat, 1332
heterokaryosis of, 879, **1261, 1262**
hyphal lysis in soil, **1416**
isolates of, modes of penetration by, 875
production of polygalacturonase and polygalacturonate trans-eliminase by, 1006
spore formation, **1261**
substrate permeability in, effect of age on, 893
virulence of, 879
Rhizoctonia bottom rot, resistance to, in cabbage, 367
rhizomorphs
on Armillaria mellea, production by N and C sources, 108
Sphaerostilbe repens, in culture, 882
Rhizopus spp.
on alfalfa, effect of frequency of cutting, leaf infection, and K on, 1040
on peaches and strawberries, effect of ozone on, 586
arrhizus, role of amino acids in spore germination of, 113
nigricans, effect on radiation resistance in, by chemicals, 230
stolonifer
control of, on strawberries, 1345
effect of temperature on growth of, on peaches and agar, 276

enzyme production by, 279
growth, in relation to polygalacturonase, 734
mycelial growth rate and sporulation in low O_2 atmosphere, 1098
sporangiospores
effect of temperatures on, 149
electron micrographs of, 871
toxic action on sweetpotato, 902
rhizosphere, behavior of Verticillium dahliae in, 427
Rhododendron spp., Phytophthora cinnamomi on, variation of pathogenicity, 585
ribonucleic acid (see also **nucleic acids**)
from cowpea chlorotic mottle virus, properties of, 881
of tobacco mosaic virus, preparation of, in a phenol-ethanol system, 875
wheat, infected Puccinia recondita, changes in, 883
ribosomes
bean mosaic virus-infected bean leaves, 889
in Nicotiana glutinosa, effect of temperature on, 502
Uromyces phaseoli uredospores, properties of, 586
rice
Helminthosporium oryzae on, kernel infection caused by, 507, 1003, **1004, 1005**
invasion and storage of fungi at moisture contents of 13.5 to 15.5%, 1162
Pyricularia oryzae on, factors affecting sporulation of, 864
seedling blight resistance, effect of soil temperature on, 640
toxicant diseases in, indicators of, 881
tungro virus on, nonpersistence in Nephotettix impicticeps, 1252
rice blast, sporulation of, factors affecting, 864
Rich, S., 896, (904)
Richards, B. L., Sr., 897
Richardson, L. T., 897
Rick, P. D., 860, 897
Rillo, A. O., 897
Rodriguez-Kabana, R., (874), 897, (1015), 1332
Roelfs, A. P., 1143
Rogers, W. E., 980
Rohde, R. A., (995)
Rohrbach, K. G., (933)
Romig, R. W., (570), (807), 1376
Roncadori, R. W., (1326), 1328
root exudates, effect on pea wilt, 721
root rot
of beans, importance of lateral roots, 292
of Sorghum vulgare, caused by Fusarium moniliforme, 148
of strawberry, reaction to races of Phytophthora fragariae, 361
root rot nematode
on cotton, effect on expression of Fusarium wilt, 319
in Hibiscus spp., reaction to, 687
on peony roots, histopathology of, 816
in sericea lespedeza, reaction to, 180
on soybeans, histochemistry of, in resistant varieties, 586
in tobacco, increase of cytokinin, 885
in Zingiber officinale, 755
Rosberg, D. W., (892)
rose
Diplocarpon rosae on, seasonal variation in host susceptibility, 1282
field inoculations with Verticillium albo-atrum, 124
pathogenicity of Diplocarpon rosae on excised leaflets of, 1277, **1278**
Prunus ringspot virus in, resemblance to symptoms by typical rose mosaic virus, 151
Ross, E. W., 897
Ross, J. P., (451)
Rowell, J. B., (570), 807, (1305)
Rubus spp. (see also **raspberry**)
strawberry necrotic shock virus infection of, 568, **569**
henryi and occidentalis, indicators for raspberry mosaic virus, 556
vitifolius, perithecial production by Gnomonia fructicola with extracts of, 197
Ruppel, E. G., 489
Russakow, Natalie, (890)
Russell, C. C., 357
russet ring virus, effect of extracts of, from apple tissues, on pathogenic fungi, 176
rust
corn- (see **Puccinia** sorghi)
dark fixation of CO_2 by leaves affected with, of wheat and bean, 164
iris (see **Puccinia** iridis)
oat crown- (see **Puccinia** coronata f. sp. avenae)
spore collection and storage, 570
translocation in beans affected with, 170
wheat leaf- (see **Puccinia** recondita)
wheat stem- (see **Puccinia** graminis f. sp. tritici)
wheat stripe- (see **Puccinia** striiformis)
rutabaga, Plasmodiophora brassicae on, race determination of, 624
Ryder, E. J., 842
ryegrass, pathogenicity of Pratylenchus penetrans and Tylenchorhynchus claytoni on, 995

Sabar, Z., (512)
Saettler, A. W., 898
safflower
lettuce mosaic virus on, 1354, **1355**
Phytophthora drechsleri on, resistance related to Ca and pectic substances, 985
Verticillium albo-atrum on, isolates of, 1155
Saksena, K. N., (645), (901)
Salama, E. A., (877)
Salama, F. M., 898, (901)
Samaddar, K. R., 898
Sands, D. C., (881), 898
Santilli, V., 326
Sass, J. E., 769
Sauer, D. B., 619
Sauer, N. I., 862
Savage, E. J., 898
Savage, H. E., 898
Savage, S. M., (1233)
Schafer, J. F., (799), (874), (876)
Scharen, A. L., 580
Scheetz, R. W., 586
Scheffer, R. P., (53), (888), (898), (1149)
Scherf, R. H., 627, 899
Schermer, A. K. F., (549)
Schindler, A. F., 899
Schipper, A. L., Jr., 899
Schippers, B., 549
Schmidt, R. A., (50), 899
Schmitthenner, A. F., (287)
Schnathorst, W. C., 58, 151, (375), 899, 1155, 1204
Schneider, I. R., (1327)
Schreiber, L. R., 899, 1110
Schroeder, H. W., (507), 640, (1003)
Schroeder, W. T., 113
Schroth, M. N., (148), (365), (898), 899
Scirrhia acicola, endospores in, **720**
Sclerophthora macrospora, hosts of, 351
sclerotia, micro-, of Verticillium
in cotton, 590, **591**
in soil, 590
Sclerotinia
homeocarpa
bases, 877
control by N, 877
galactose production by, counteraction of glucose inhibition of root inhibition by, 888
sclerotiorum
breakdown of hemicellulosic substances by, 880

in sunflower and tomato, degradation of pectic substances by, 975
trifoliorum, effect of C on growth of, 906
Sclerotium
bataticola
on corn, effect of planting date on, 829
substrate permeability in, effect of age on, 893
rolfsii
in atrazine-treated soil, effect of C and N on growth of, 874
effect of herbicides on growth of, 897
enzyme production by, 279
on rice, effect of soil temperature on, 640, **641, 642**
on tomato, effect of fumigants on, 929
toxicity of thiosemicarbazones to, 485
wheat tolerance to, testing for, 884
Scott, H. A., (585), 900
Scott, K. J., (1418)
scurf development, in sweetpotatoes, affected by length of slender attachment root, 1257
seed rot, Pythium on soybean, effect of O_2 concentration on, 407
seed treatment, control of wheat flag smut by, 98
seedling blight
of corn, control by bacteria and Chaetomium, 885
of rice, effect of soil temperature on, 640
Semal, J., (1210)
Semancik, J. S., (874), 900, 1190
Semeniuk, G., 351
Semeniuk, P., (1277), (1283)
Senecio
cruentus, starch lesion assay host for chrysanthemum stunt virus, 886
vulgaris, Verticillium-infected achenes of, antifungal properties of soil on dissemination of pathogen from, 549
senescence (see also **cell death**)
sorghum stalk tissue, effect of plant injury on, 295
on tobacco leaves, prevention by C filter, **466**
Septoria
lactucae and linicola, inhibition by Lycopersicon esculentum, 870
lycopersici, detoxification of tomatine by, 870
nodorum, cyclic production of pycnidia and spores on dead wheat tissue, 580, **581**
tritici, on wheat, resistance to, 897
Sequeira, L., (894), (895), (1047), (1054)
serology
agar gel test for plant viruses, 944, **946**
bacterial diseases, detection of, in beans, 147
barley stripe mosaic virus protein, 879
complement fixation test for plant viruses, 944
cucumber mosaic virus, identification of, 152
Erwinia nigrifluens, 907, 1381
pea enation mosaic virus, 148
relationship between Agrobacterium tumefaciens, Escherichia coli, and E. mutabilis, 145
tobacco mosaic virus, chemically induced mutants and natural strains, 905
tube precipitin test comparison for plant viruses, 944
maize dwarf mosaic virus, 1422
Shaalan, M. I., 664
Shalla, T. A., (562), (738), (878)
Shands, H. L., 900
Sharon, E. M., (900)
Sharp, E. L., (895)
Shatla, M. N., 923
Shaw, J. G., 900
Shay, J. R., 363
Shepherd, R. J., (148), (458), (879), 900
Shepherd, R. L., (102), (180)
Sher, S. A., (896)
Sherwood, R. T., 279, (1136)
Shigo, A. L., 900
Shih, Madeline, (903)
Shikata, E., 586
Shimomura, T., (1236)
Shrum, R. D., 901
Silbernagel, M. J., (645), 901
Sill, W. H., Jr., (664), (877)
Simons, J. N., 1370
Simons, M. D., 36, 41
Sinclair, J. B., (877), 901
Singh, D., 901
Singh, M., 901
Singh, R. P., 901
Sinha, R. C., 902
Sisler, H. D., (880)
Skelly, J. M., 902
Slykhuis, J. T., 902
Smale, B. C., (464)
Small, R. H., (691)
Smalley, E. B., (901)
Smith, D. H., 586
Smith, M. A., 902
Smith, R., (889)
Smith, R. S., Jr., 61, (889)
Smith, S. H., 902
Smith, W. L., Jr., 586
smut (see also under genera of)
in 16th Century herbals, 853
wheat flag-, soil factors influence on infection and control by fungicides, 98
snapdragon, Verticillium albo-atrum on, differentiation of, isolates of, 1155
Snazelle, T. E., (474)
Sneh, B., 74
Snodgrass, Charlotte J., (584)
Synder, W. C., (197), (353), (460), (590)
Sobers, E. K., 128, 455, 804, 1106, (1361)
sodium
injury to chrysanthemum cuttings, excess of, 713, **715**
in sugar maples, 633
sodium dehydroacetate, Penicillium expansum resistance to, 870
sodium-N-methyldithiocarbamate, deactivation of, in soil by nematocides, 967
sodium ortho-phenyl-phenate, Penicillium expansum resistance to, 870
soil
evaluating inoculum density of Rhizoctonia in, 74
forest-, Phytophthora and Pythium spp., 872
lysis of fungal mycelium in, 595
recovery of Fomes annosus spores from, 885
soil extracts, Fusarium solani chlamydospore formation in, 353
soil factors
soil moisture
effect on Fusarium blight of turfgrasses, 781
influence on infection by wheat flag smut fungus, 98
temperature, effect on
flag smut infection on wheat, 98
seedling blight of rice, 640
seedling disease of cotton, 896
soil fertility, effect on cell death in corn stalk tissue, 850
soil fumigants
evaluation of, comparison of application methods for, 585
nematocidal and fungicidal properties of, 691
soil fungi, colonization of wood by, 301
soil fungistasis (see **fungistasis**)
soil microorganisms
antagonism, agar plate inhibition test for determination of, 882
effect of Dexon on, 869
Phytophthora cactorum and Pythium ultimum, mode of infection on peach roots, 46
response to antibiotics in pimaricin-vancomycin medium, 152
Rhizoctonia, evaluating inoculum density, methods for, 74

survival of Thielaviopsis basicola as chlamydospores in soil, 1012
Solit, Elinor, (245)
Somers, E., 1031
Sommer, N. F., (145), (149), (872)
Sorensen, E. L., (906)
sorghum
Colletotrichum graminicola on, relationship of cell death patterns, 468
Fusarium root rot of, 148
Macrophomina phaseoli on, predisposition to, role of seed production in, 876
Periconia circinata toxin A on, inhibition of growth of susceptible roots by, 1149
Sphacelotheca cruenta on, **1342**
Sphacelotheca reiliana on, highly germinable chlamydospores in young sori, 903
stalk tissue, effect of plant injury on senescence of, 295
sour cherry yellows virus, on Prunus cerasus, similar symptoms to cherry rugose and recurrent ringspot viruses, 150
southern bean mosaic virus
on bean
free nucleotides of, 871
ribosomes from, 889
in bean leaves, change in peroxidase by, 669
chemical comparison of, 879
long-term storage of, freeze-dried in presence of lactose, 1327
soybeans
brown stem rot on, factors influencing spread of, **298**
Cercospora sojina on, change in P^{32}, pigment, and starch, **987**
Diaporthe phaseolorum sojae on
effect of amino acids and sugars on growth of, 92
stem canker and blight caused by, 396, **400**
disease resistance of, broken by heat, 70
Heterodera glycines on, resistance to, 451, **453,** 873
N and K in leaves and stems of, 83
phosphorus toxicity in, Bacillus subtilis associated with, 83
Phytophthora megasperma sojae on
protection of, by inoculation with Phytophthora cactorum, 894
proteins resistant to, compared electrophoretically, 287
Pythium seed rot of, effect of O_2 concentration on, 407
root knot nematode on, histochemistry of resistance to, 586
seed coat discoloration in, influence of virus infection, 884
storage fungi on, 412
tolerant varieties, phosphorus content in leaves and stems of, **83**
varieties, difference in bacterial populations, 85
soybean cyst nematode, morphologically different isolates, variation in development of, 585
Spalding, D. H., 586, 902
SPCP, with DMSO, effect of Monilinia fructicola, 874
Sphacelotheca cruenta, on sorghum, local infection, **1342**
Sphacelotheca reiliana, on sorghum, highly germinable chlamydospores in young sori, 903
Sphaeropsis malorum, effect of extracts from virus-infected apple and pear tissues on, 176
Sphaerostilbe repens, rhizomorph stimulation in culture, 882
Sphaerotheca fuliginea, on cucumber, fine structure and isolation of haustoria from, 584
Spilocaea eriobotrye, scab of loquat, toyon, and kageneckia, 147
sporangia
Phytophthora parasitica, production of, 359
Phytophthora parasitica var. nicotianae, production of, in presence of tobacco rhizosphere and soil fungi, 587
spore dispersal
of Cercospora hayi from banana, influence of rain and wind on, 1290
of Fusarium roseum 'Gibbosum' associated with crown rot of bananas, 545
spore germination (see **germination**)
spore samplers and traps (see **techniques**)
spores
gamma-radiation on, recovery of, 145
population variation in a mesic forest, 875
sporulation
Alternaria tenuis
effect of light on, 883
in a low O_2 atmosphere, 1098
Ascochyta pisi, effect of light on, 149
Botrytis cinerea, in a low O_2 atmosphere, 1098
Cladosporium herbarum, in a low O_2 atmosphere, 1098
Helminthosporium vagans, effect of moisture and temperature on, 1294
Monilinia fructicola, biochemical factors affecting, 877
of Mucorales, mitochondrial degeneration, 872
Phymatotrichum omnivorum, induction of, 907
Peronospora manshurica, factors associated with, 889
Pseudoperonospora humuli, on hop leaves lacking stomata, 150
Rhizopus stolonifer in a low O_2 atmosphere, 1098
Spurr, H. W., Jr., 902
squash, storage rot of, by Fusarium roseum, 146
squash mosaic virus
biochemical and biophysical properties of, host range, 877
immune fluorescence and radioautographic studies of, 877
Stace-Smith, R., (944)
Stahmann, M. A., (669), (1066)
Staley, J. M., 903
stalk rot, on corn
caused by Fusarium moniliforme, 983
effect of planting date on, 829
Stall, R. E., 1152
Stallknecht, G. F., (702)
Stanghellini, M. E., 151, 444
Staples, R. C., 586
starch
Avena sativa infected by Puccinia graminis avenae, fluctuation of, 1220
Hordeum vulgare infected by Erysiphe graminis, fluctuation of, 1220
Phaseolus vulgaris infected by Uromyces phaseoli typica
fluctuation of, 1220
patterns associated with, 899
soybean leaves infected by Cercospora sojina, change in, **987**
starch gel electrophoresis, proteins from three Phytophthora spp., 1334
Starr, M. P., (1414)
Stavely, J. R., 309, 795, 940, 957, 1412
Steere, R. L., 587, (1426)
sterol, relationship to light in sporangial induction in Phytophthora capsici and P. palmivora, 880
Stewart, R. N., (1277), (1283)
sting nematodes, effect on expression of Fusarium wilt of cotton, 319
Stokes, G. S., 678
Stoner, M. F., 151
stony pit virus, in pear tissues, effect of extracts on pathogenic fungi, 176
storage
culture media, 352
hard red spring and winter wheat, 619
rice at moisture content of 13.5 to 15.5%, invasion of fungi, 1162

rot, of Hubbard squash by Fusarium roseum, 146
rust spores, **570**
soybeans, effect of moisture content, temperature, and time on invasion of, 412
Strandberg, J. O., 903, (907)
strawberry (see also **Fragaria chiloensis**)
effect of ozone on appearance and decay of, 586
nonretention of semipersistent viruses through ecdysis by Pentatrichopus jacobi, 1318
Phytophthora fragariae, reaction to, 361
postharvest decay of, 1339, 1345
resistance to Verticillium wilt in natural populations of, 219
stimulation of perithecial production by Gnomonia fructicola with extracts of, 197
strawberry pseudo mild yellow edge, a new virus disease in, **571**
strawberry necrotic shock virus, infection of Rubus with, 568, **569**
Streeter, D. G., 419
Streptomyces sp., antibiotic from, 896
griseus, antibiotic produced by, 150
streptomycin, residue on apple as related to application schedule, 584
stripe rust (see **Puccinia** striiformis)
Strobel, G. A., (896), (1365)
Struble, F. B., (907), 1217
Stuteville, D. L., (906)
Subbarayudu, S., 903
Sudia, T. W., (903)
sugar beet
chemotaxis of Aphanomyces cochlioides zoospores to, 896, 1365
susceptibility to Heterodera schachtii, influence of seedling age on, 883
sugar maple
chloride in, 633, **635**
Eutypella parasitica of, 885
sodium in, 633, **635**
sugar pine (see also **Pinus spp.**)
charcoal root disease of, 61
sugar repression, of cellulase synthesis and endopolygalacturonase, as resistance mechanisms in onion pink root, 908
sugarcane, seed, virus of ratoon stunting disease not transmitted by, 878
sugarcane mosaic virus, electron microscopy of, 371, **372**
sugars, effect on
germination of Ustilago maydis, 479
growth of Diaporthe phaseolorum var. sojae, 92
metabolism of teliospores of Ustilago maydis, 479
sulfur-35, absorption and translocation in oat plants, 272
sulfur dioxide, fungi spore sensitivity to, 880
Summers, T. E., (687)
Sumner, D. R., 903
sunflower
Sclerotinia sclerotiorum in
breakdown of hemicellulosic substances by, 880
degradation of pectic substances by, 975
Verticillium albo-atrum, resistance to, 881
survival
Cephalosporium gramineum in naturally infested wheat straws in soil, 213
Ceratocystis ulmi in elm seedling, 899
Cercospora hayi spores from banana, influence of rain and wind on, 1290
Fusarium moniliforme, thickened hyphae, 893
Meloidogyne incognita, in absence of O_2, 872
Phytophthora phaseoli overwintering on lima bean, **96**
prior-colonization as a factor of, 766
Pseudomonas glycinea and P. tabaci after alternate freezing and thawing, 903
Puccinia graminis tritici urediospores on wheat foliage, effect of temperature, 902
Puccinia striiformis, effect of low temperature, 148
Thielaviopsis basicola, as chlamydospores in soil, 1012
Urocystis colchici, teliospores and mycelia in soil, 136
Sutton, M. D., 727
Swearngin, Lynda L., 903
sweetpotato
Ceratocystis fimbriata on, immunity to, 1066, **1068**
disease resistance in, multiple-, 888
extracts from, effect on perithecial production in Gnomonia fructicola, 197
Fusarium oxysporum batatas on, resistance to, 1217
Meloidogyne incognita on, resistance to, 1217
Rhizopus stolonifer on, toxic action of, 902
scurf development on, effect of slender attachment roots, 1257, **1258**
sweetpotato internal cork virus, electron microscopy of, 898
Swenson, K. G., 269
sycamore, Botryodiplodia theobromae in, 878

Tachibana, H., 136, 903
Takahashi, T., (1236)
Tarry, J., (870)
tatter leaf virus, mechanical transmission of, from cowpea to citrus, 575
Taxus sp., Phytophthora cinnamomi on, variation of pathogenicity, 585
Taylor, D. P., (88)
Taylor, E. E., (375)
Taylor, J., 553
Taylor, O. C., (897)
techniques
agar plate inhibition test, antagonism between soil microorganisms, 882
azide-rose bengal medium. isolation of Fusarium spp. from red clover roots, 584
collection of fungal spores from infected plants, **1102**
computers, use with Barratt-Horsfall rating system, 583
culture of Puccinia sorghi on detached leaves of corn and Oxalis corniculata, 536
detection of ethylene thiuram monosulfide, 584
dialysis tubing cellophane, for isolation of single spores, 346
disruption and enzyme extraction from rust urediospores, 860
Erysiphe graminis, testing resistance to, **1428**
Erysiphe polygoni, identification and maintenance of, 795, **797**
fluorescent brightener, for labeling Cronartium ribicola basidiospores, 894
fungistatic and fungicidal values of chemicals, **205**
gas-phase chromatography, to determine minute quantities of pentachloronitrobenzene, 887
HCl-Giemsa, study of Ceratocystis fagacearum asexual nuclear behavior with, 906
immersion tube method, use in isolating Rhizoctonia from soil, 74
medium for
culturing Dothidella ulei, 564
culturing Phytophthora, 893
storage, using ethylene and propylene oxide, 352
urediospore survival of rust, 1432
zoospore production by Phytophthora, 359
O_2-N ratio for disease development, **408**
penetrometer for measuring tissue maceration, 279
phase-contrast microscopy, study of asexual nuclear division with, 869
phenol-ethanol system (one-phase), preparation of tobacco mosaic virus ribonucleic acid by, 875
plant debris particle isolation, use in isolating Rhizoctonia from soil, 74
plant segment colonization method, use in isolating Rhizoctonia from soil, 74
planting and inoculating wheat leaf rust differential varieties, 895

plastic film, to control soil-borne pathogens of tomato, 929
protein extraction and electrophoresis, 287
race determination of Plasmodiophora brassicae, 624
relative humidity control, microenvironment chamber, 980, **981**
separation of chlamydospores from mycelia and endoconidia in Thielaviopsis basicola, 337
separation of U-1 and U-2 tobacco mosaic virus strains by electrophoresis, 419
serology (see **serology**)
silica gel diffusion, determining fungal germination and growth responses to nutrients, 248
soil fumigants, evaluation of, comparison of application methods for, 585
soil fungistasis, method for assaying, 576
spore sampler
24-hour type, 517, **518**
use in aircraft, 872
spore trap
collection from infected plants, 1102
release from basidiocarps, **50**
spot plate method for bioassay of Cylindrocladium scoparium, **1116**
storage of rust spores in liquid N, **570**
varietal testing, wheat to Sclerotium rolfsii, 884
virus purification, tobacco streak, 645, **647**
xylem vessel fluid, apparatus for collecting, 463
Teliz, D., 151, 658
temperature, effect on
aflatoxin production by Aspergillus flavus, 899, 1390
aster yellows symptoms on barley, 369
bacterial spot development in excised pepper and tomato leaves, 1194
barley yellow dwarf symptoms on barley, 369
buildup of Tylenchorhynchus martii, 894
charcoal root disease of Pinus lambertiana, 61
Colletotrichum lilii on Easter lily, 1106
colonization of
lima bean, by Phytophthora phaseoli, 1274
Pinus elliottii by Fomes annosus, 897
conidial formation by Phoma herbarum medicaginis, 873
cytological abnormalities, in Nicotiana glutinosa, 705
differentiation of genotypes for BV2 resistance in pea, 113
exudation from cotton and bean seed, 148
germination of Erysiphe polygoni on Trifolium pratense, 940
growth of
Erysiphe polygoni on red clover, 940
Helminthosporium vagans, 1294
Rhizopus stolonifer on peaches and agar, 276
Hemicycliophora arenaria, egg hatch and motility, 889
mosaic symptoms on muskmelon, 146
pathogenicity of Helminthosporium vagans to Poa pratensis, 1294
peach seedling canker, chilling, 146
potato virus X inclusions in potato leaves, 882
Puccinia graminis tritici urediospores on wheat foliage, survival of, 902
pycnidial formation by Phoma herbarum medicaginis, 873
resistance of mature oat tissues to Puccinia coronata avenae, 874
response of Xanthi tobacco plants to tobacco mosaic virus, 873
Rhizopus stolonifer sporangiospore development, 149
root necrosis of peach, 895
sporulation of
Erysiphe polygoni on Trifolium pratense, 940
Helminthosporium vagans, 1294
storage fungi of soybeans, 412
survival of stripe rust fungus, 148
symptom expression in tomato double virus streak, 892
tomato early blight, 1430
Trichodorus christiei on wheat, 907
uredospore production of Puccinia recondita, 584
virulence of Phytophthora megasperma, 653
viruslike symptoms in Nicotiana glutinosa, 148, 502
Templeton, G. E., (879)
Tephrosia vogelii, histology of, inoculated with Phytophthora parasitica nicotianae, 489, **490, 491**
Thanatephorus praticolus, inhibitor of, in nursery soils, 905
thiamine, effect on growth of Phytophthora, 812
Thielaviopsis basicola
carrot resistance to, role of MMHD in, 187
chlamydospores
albino-, behavior, 887
survival of, **1014**
on cotton, cause of yield reduction, 1213, **1215**
culture filtrates of, detection of pectic enzymes in, 585
effect on Verticillium albo-atrum on cotton, 888
survival in soil as chlamydospores, 1012
Thies, W. G., 1116
thiosemicarbazones, fungitoxicity of, 485
Thomas, C. A., (893), 985
Thomas, C. E., 903
Thomas, P. E., 904
Thomas, W. D., Jr., 151
Thomason, I. J., (888)
Thompson, J. P., (365)
Thorn, G. D., (897)
Throneberry, G. O., 904, (963)
Tietz, Helga, (853)
Tilletia tritici, on wheat, breeding for resistance to, 664
Timian, R. G., 1233
Ting, W. P., (899), 904
tissue culture, growth of healthy and virus-infected tissue, 731
tobacco (see also **Nicotiana**)
California tobacco rattle virus on, 738, **740**
cytology of infected cell, 744
intracellular appearance, 744, **749, 750, 752,** 754
callus tissues of, growth, 731
Meloidogyne incognita on, increased cytokinin in, 885
ozone fleck and senescence of, prevention by C filter, **466**
Phytophthora parasitica nicotianae on
reaction of races 0 and 1 to, 678
resistance to, 678, **679**
Pseudomonas solanacearum on, stimulation of aromatic biosynthesis, 894
Pseudomonas syringae, synthesis of β-glucosidase by, 881
virus of, resistance to, 904
tobacco etch virus
activity in callus tissue of tobacco, 731
on Capsicum annuum, resistance to, 1370
tobacco mosaic virus
chemically induced mutants of, serology of, 905
determination by electron microscopy and immunofluorescence, 146
distribution of, in local lesions of Datura stramonium, 146, 1348, **1350**
effect on survival of dissociated tomato callus cells, 892
inclusions, cinephotomicrography of, 901
multiplication, inhibition by Blasticidin S, 1236
on Nicotiana glutinosa, electron microscopy of dark green spots on leaves of, caused by, 192
on Nicotiana tabacum, disease development, 892
ribonucleic acid of
preparation in a one-phase phenol-ethanol system, 875
reactions of Hg(II) with, 326
strains
separation by electrophoresis, 419
serology of, 905
on tomato, resistance to, 869

uncoating of following inoculation, 900
in Xanthi tobacco, effect of temperature on, 873
tobacco necrosis virus, relationship to Olpidium zoospores, 146
tobacco rattle virus
degradation products of, relation to normal particle population, 900
on pepper, properties and purification of, 1190, **1191, 1192**
tobacco ringspot virus
activity in callus tissue of tobacco, 731
association within Xiphinema americanum, 862
in Nicotiana tabacum, influence of red light on content of, 1108
tobacco streak virus, bean red node strain, purification of, 645
Toler, R. W., 183, (871)
tolerance (see also **resistance**)
barley to spot blotch, 79
bean to halo blight, **681**
kernel weight, measure of, 39
oats to crown rust, 36
relationship to planting date, 41
wheat to Sclerotium rolfsii, testing of, 884
Tolin, Sue A., (881)
Tollenaar, H., 787, 1036
tomatine, detoxification of, by Septoria lycopersici, 870
tomato
Alternaria solani on, inhibition of growth in chemical control of, 905, 1430
bacterial spot, in excised leaves of, effect of temperature on, 1194
Cladosporium fulvum on, effect of minerals on, 493
fumigants and plastic film for control of soil-borne pathogens of, 929, **930**
Fusarium oxysporum f. lycopersici on, effect of fumigants and plastic film in control of, 929
Fusarium wilt in, resistance to, breaking of, by Meloidogyne incognita, 871
Phoma destructiva on, effect of fumigants and plastic film in control of, 929
Pseudomonas solanacearum on, effect of fumigants and plastic film in control of, 929
Sclerotinia sclerotiorum in, degradation of pectic substances by, 975
Sclerotium rolfsii on, effect of fumigants and plastic film in control of, 929
Septoria lactucae and linicola inhibited by, 870
tobacco mosaic virus on, resistance to, 869
Verticillium albo-atrum on, isolates of, 1155
tomato double virus streak, effect of temperature and virus titer on symptoms, 892
tomato ringspot virus
activity in callus tissues of tobacco, 731
natural occurrence in birdsfoot-trefoil, 585
transmission by Xiphinema americanum, 151, 658
tomato yellow leaf curl virus
on Datura stramonium and tomato, **1130**
whiteflies as vectors of, host range, 1127
Tomlinson, H., (896), 904
Toussoun, T. A., (887), (889)
toxins
aflatoxin
associated with fluorescent cotton seed, 1104
effect of temperature on, 899
occurrence in cotton seed, 889
Dothidella ulei, production, 719
Periconia circinata toxin A, amino acid composition of, 1149
victorin
effect on
enzymes and nucleic acid of oats, 906
ultrastructure of oats, 1178, **1181**
phytokinins affecting, 887
tissue respiration affected by, 1196
victoxinine, from Helminthosporium spp., 53
Toxoptera graminum, cucumber mosaic virus transmitted by, 1420
translocation
fungicides in Prunus domestica, 933
healthy and rust-affected beans, 170
P^{32} into sclerotia of Phymatotrichum omnivorum, 903
phytoactin in Pinus albicaulis, 148
S^{35} in oats inoculated with crown rust, 272
in wheat, effect of Puccinia recondita on, 799
transmission
insect- (see **insect transmission**)
mechanical-
onion yellow dwarf virus, **1020**
raspberry viruses to herbaceous hosts, 1245
ringspot-like virus from white ash, 323
tatter leaf virus from cowpea to citrus, 575
Traylor, J. A., 152
Trechispora brinkmanni, colonization of wood by, 301
Tremaine, J. H., 152
Treshow, M., 904
Trichoderma spp.
on alfalfa, effect of frequency of cutting, leaf spot, and K on, 1040
relation to survival of Cephalosporium gramineum in naturally infested wheat straws in soil, 213
album, effect of establishment in host tissues on survival, 766, **768**
viride
in atrazine-treated soil, effect of C and N on growth of, 874
colonization of wood by, 301
effect of establishment in host tissues on survival, 766, **768**
effect upon penetration of alfalfa roots by Pratylenchus penetrans, 1132, 1320
Trichodorus christiei
on azalea, effect of nutrients on activity of, 1024
on cotton seedlings, parasitism of, 573
on wheat
effect of temperature on development of, 907
parasitic habit, **357**
Trifolium pratense (see also **red clover**)
Erysiphe polygoni on
clones resistant to, 957, **961**
effect of relative humidity and temperature on development of, 940
isolates of, pathogenicity and morphology of, 309
races of, identification and maintenance, 795, **797**
Pythium ultimum on, relation to seed concentration in soil, 879
Trione, E. J., (149)
Triticum aestivum (see **wheat**)
Troll, J., 995
Troutman, J. L., 587, 904
True, R. P., (1091)
Trujillo, E. E., (334)
Tsao, P. H., 152, (359), (893), 1012
Tsuga sp., Phytophthora cinnamomi on, variation of pathogenicity, 585
tungro virus, on rice, nonpersistence in Nephotettix impicticeps, 1252
turfgrass, Fusarium roseum on, 583, 781
Turner, G. O., (691)
Turner, N. J., 905
Tylenchorhynchus
claytoni
on azalea, effect of nutrients on activity of, 1024
on grasses, pathogenicity to, 995
martini, effect of temperature on buildup of, 894
Tylenchulus semipenetrans
reproduction on four reciprocally grafted hosts, effect of scion and rootstock, 438
uptake of ethylene dibromide by, 888
Tylenchus hexalineatus, host-parasite relations, 898
Tyner, L. E., 776

typical rose mosaic, symptoms, resemblance to, by Prunus ringspot virus in rose, 152

Ullstrup, A. J., (474)
Ulmaceae, species varying in resistance to Dutch elm disease, nitrogenous compounds in xylem sap of, 901
Ulmus americana, growth of Ceratocystis fagacearum, C. ulmi, Fusarium oxysporum perniciosum, and Verticillium albo-atrum on xylem sap of, 1165
ultrastructure (see also **electron microscopy** and **fine structure**)
effects of victorin on leaf and root tissues of Avena spp., 1178
Geotrichum candidum, 885
Meloidogyne hapla, body wall of, 883
Plasmodiophora brassicae, 907
Uota, M., (1339)
Upadhyay, J., 760, 791
urea-N, role in corky root rot of letttuce, 1047, **1051**
uredospores
absorption and translocation of S^{35} in oat plants inoculated with, 272
Puccinia graminis and P. striiformis, in vitro germination at low spore densities, 1036
Urocystis
agropyri
control by fungicides, 98
soil factors affecting infection by, 98
symptoms of, in greenhouse, 896
cepulae, effect of oxathiin systemic fungicides on, 876
colchici, survival of teliospores and mycelia in soil, 136
Uromyces phaseoli
dark fixation of CO_2 by "malic enzyme" of, 897
uredospore germination, effect of light on, 1316
uredospore ribosomes of, properties, 586
Uromyces phaseoli var. typica
on bean, starch patterns associated with, 899
on Phaseolus vulgaris, fluctuation of starch amount caused by, 1220
protocatechuic acid, identification and isolation of, 880
translocation in beans affected with, 170
Ustilago
avenae
amino acid content of, 1225
effect of x-radiation on germination and virulence of, 265, **267**
kolleri, amino acid content of, 1225
maydis
on corn, hydrocarbon change in, 886
teliospores of, effect of sugars on germination and metabolism of, 479

Vaartaja, O., 905
Vakili, N. G., 355
Vanderveken, J., 1210
Van Etten, H. D., 905
Van Gundy, S. D., (438), (880)
Van Regenmortel, M. H. V., 905
variegation virus, on citrus, host reactions to, 347
Venturia inaequalis
apple resistance to, 588
effect of fungicides on, 583
Verticillium
albo-atrum
anastomosis of, in soil, **1110**
on Antirrhinum majus and Carthamus tinctorius, differentiation of isolates, 1155
conidia
characteristics of respiration, 963
movement of, 375
on cotton
cross-protection with strains of, 151, 1204, **1206, 1207**
development of, 1121, **1122**
differentiation of isolates, 1155, **1156, 1158**
effect of Thielaviopsis basicola on, 888
host range, 1155
inoculum increase on, 590
penetration of, 1121, **1122**
resistance to, 899
seed, dissemination on, 460
dahliae
in alfalfa-amended and oat residue-amended soils, availability of nutrients, 895
behavior in the rhizosphere, 427
effect
of fungitoxins isolated from cotton on, 583
on phenolic and protein biosyntheses of potato tuber discs, 894
of soil antifungal properties on dissemination of, and seedling infection by, 549
of systemic insecticides on, 882
in Fragaria chiloensis, resistance to, 219
growth of, effect of pH, C, and N sources on, 401
growth on xylem sap of five tree spp., 1165
hyphal lysis in soil, 595
on Lycopersicon esculentum, differentiation of isolates, 1155
microsclerotia of, in cotton, 590, **591**
pectolytic enzyme production by, enhancement by L-alanine, 871
on potato, synthesis of chlorogenic acid in resistant plants, 971
respiratory enzymes, activities and characteristics, 904
on rose
failure of infection in rootstocks grown in infected soil, 124
transmission by budding, 124
on sunflower, resistance to, screening for, 881
Vest, G., (879)
vetch (see **Vicia spp.**)
Vicia spp., and F_5 hybrids from interspecific cross reaction to five root knot nematodes, 102
Victoria locus, inheritance of spontaneous mutations of, in oats, 210
victorin
effects on ultrastructure of leaf and root tissues of Avena spp., 1178, **1179, 1180, 1181**
enhancement of effects by phytokinins, 887
victoxinine, production by Helminthosporium spp., 53
Vigna sinensis (see also **cowpea**)
alfalfa mosaic virus on, two strains, **1029**
Virginia pine, disease resistance in, 584
virulence
effect of x-radiation on, in Ustilago avenae, 265
variation in Phytophthora megasperma, 653
viruses (see also **insect transmission** and **aphid(s)**)
activity in callus tissues of tobacco in vitro, 731
apricots as host for stone fruit-, 152
boron deficiency related to, in sweet cherry, 150
bud indexing of, failure to detect prune dwarf, 650
characterization of
California tobacco rattle-, 739
Eola rasp leaf-, on cherry, 149
maize dwarf mosaic-, 474
pea enation mosaic-, 148
potato-, 587
tobacco streak-, 645
cytology of infected tobacco cells, 744
effect of extracts from
infected apple and pear on fungi, 176
red clover flowers on red clover vein mosaic, 832
electron microscopy of
in sugarcane mosaic, 371
tobacco mosaic, 146
electrophoresis used to separate strains of, 419
field spread, bean to red clover, 147

glucose effect on infection of Gomphrena globosa, 832
growth affected by, in pear, 150
heat treatment of, on raspberry mosaic-, 556
host reactions to citrus infectious variegation, 347
immunofluorescence used to study distribution of, 146
index host for prune dwarf, 65
infectivity of, related to ribonuclease of, in cucumber, 149
inhibition of, influenced by darkness, in potato virus X, 431
inhibitor of, in potato, in plants infected with late blight, 560
latent infection of potato virus X on Gomphrena, 431
light as affecting, lesion formation in Gomphrena, 364
local lesion host for, on Galactia sp., 458
local lesions of, affected by fluoride, 904
masking of, by high temperature, in muskmelon, 146
nematode transmission of, 151, 658
oil sprays for control of cucumber mosaic, 512
predisposition of, to fungal pathogens, in corn, 892
resistance to, evaluation by aphid transmission in bean, 269
ribonuclease-sensitive infectious units from, in pea streak, 462
seed abortion caused by, in citrus, 145
seedcoat discoloration caused by, in soybean, 884
serological tests for
comparison, 944
cucumber mosaic, 151
pea enation mosaic, 148
stylet-borne, aphid acquisition of, 870
temperature, effect on
in muskmelon, 146
in tobacco, 502
translocation of, failure in cowpea, **562**
in vector hemolymph, 586
yield reduced by, in bean, 147
Vlamis, J., (713)
Voigt, R. L., (876)
Vomvoyanni, V. E., 1330
Voth, V., (219)

Wadley, B. N., 152
Wagner, G. W., 1422
Wahl, I., (74)
Walker, J. C., (367), (681), (875)
Wallace, J. M., (347)
Wang, C. H., (999)
Warmke, H. E., (1178)
Watson, A. G., 905
Watson, R. D., (146), 152, 352, (882)
Weathers, L. G., (874)
Webb, R. E., (146)
Weber, D. J., 118, (886), 1066
Webster, R. E., 95
Weerapat, P., 640
We-Hadidi, A. F., 877
Weinhold, A. R., 108, (148), (878), (886)
Weintraub, M., (148), (502), 705
Welton, R. E., (269)
Welty, R. E., 905
Westdal, P. H., (369)
western wheatgrass, pathological changes in, induced by Anguina agropyronifloris, 769
western white pine, translocation of phytoactin in seedlings of, 373
wheat
bacteriophages in, 727
breeding resistance to bunt, rusts, and viruses in, 664
dark fixation of CO_2 by healthy and rust-affected leaves, 164
hard red spring-, comparison to winter in storage, 619
lines resistant to stem rust, decarboxylation of indoleacetic acid by, 610
primary infection by Erysiphe graminis, 389
Puccinia graminis tritici on, infection processes altered, 223, **225**
Puccinia recondita on
changes in nucleotide composition of RNA induced by, 883
nutrition mobilization by, 799
Puccinia striiformis
effect on root development of, 149
invasion of microorganisms and survival of, 887
rust incidence on, correlated with spore trapping, 1376
saprophytic survival of fungi in straw of, prior-colonization as a factor in, 766
Sclerotium rolfsii on, testing for tolerance to, 884
Septoria nodorum on, pycnidial and spore production on dead tissue of, 580
Septoria tritici on, resistance to, 897
storage of rust spores of, 570
Trichodorus christiei on
effect of temperature on development of, 907
feeding habits on, 357
viruses in, predisposition to pathogens, 892
wheat mosaic virus, in wheat, breeding for resistance to, 664
wheat streak mosaic virus
differentiation from Agropyron mosaic virus by cross-protection and serological tests, 902
in wheat, breeding for resistance to, 664
Wheeler, H., (880), 906, (1196)
white ash (see **Fraxinus americana**)
white clover, Leptosphaerulina trifolii on, effect of light on sporulation of, 903
whiteflies, vectors of tomato yellow leaf curl virus, 1127
Whitehead, M. D., 396
Wihrheim, S., (890), 906
Wilcoxson, R. D., 364, (832), (873), (903)
Wilhelm, S., (124), (219), (460), (590), 853
Wilkinson, R. E., (1079)
Williams, E. B., (187), (588)
Williams, F. J., 531
Williams, H. E., (152)
Williams, L. E., (892)
Williams, P. G., 1418
Williams, P. H., 367, 521, 624, (903), (907)
Williams, W. T., 906
Willis, C. B., 906
Willis, W. G., 906
Willis, W. H., 587
Wilson, C. L., (869), 906
Wilson, E. E., (907), (1381)
Wilson, F. D., 687
Wilson, R. A., (464), (584)
wilt
on mint, resistance to Verticillium dahliae on roots of, 427
in pea, root exudates affecting, 721
Winstead, N. N., 134
Wisconsin pea streak virus
recovery and transmission by seed, 858
ribonuclease-sensitive infectious units from, 462
wood, colonization by soil fungi, 301
wood deterioration, role of N in, 1083
Wood, F. A., 50, (901), 906
Woods, Rae, 907
Worf, G. L., (1024)
Worley, J. M., 1327
wound periderm, formation in and relation to resistance of papaya fruit, 444
wound-tumor virus, in vector hemolymph, 586
Wright, N. S., 944
Wyatt, W., 585
Wyllie, T. D., (889), (890)
Wysong, D. S., 26

Xanthi tobacco, tobacco mosaic virus in, effect of temperature on, 873

Xanthomonas spp., unaltered by passage through nonhost, 151
campestris, activity of cauliflower seed extract against, 497
cyamopsidis, on guar, effect of light and N on, 893
malvacearum, symptoms on Bountiful bean, **59**
phaseoli, symptoms on Bountiful bean, **59**
vesicatoria, lesion development and multiplication in resistant pepper, 1152
Xiphinema americanum
tobacco ringspot virus associated within, 862
transmission of
grape yellow vein virus and peach yellow bud mosaic virus by, 658
tomato ringspot virus by, 151, 658
x-radiation, effect on spore germination and stability of virulence in Ustilago avenae, 265
xylem, apparatus for obtaining fluid from, 463

yam-dextrose agar, for cultivation of fungi in the Tropics, 1336
Yang, C .Y., 907, (917), (923)
Yarwood, C. E., 138, 152, 153, 510, (536)
yellow poplar
Armillaria mellea and Margarinomyces sp. as causes of root and butt rot in stump sprouts, 1091
butt and root rot of stump sprouts, **1093**
Young, H. C., Jr., (895), 907
Yukawa, Y., (903), 907

Zaki, A. I., (122)
Zea mays (see **corn**)
Zeitoun, F. M., 907, 1381
Zentmyer, G. A., 710, (890), 907, (1076), (1334)
Zettler, F. W., 1079
Zingiber officinale, Meloidogyne incognita in, 755, **757**
Zitter, T. A., (892)
zoospore
infection of bentgrass roots by Pythium aphanidermatum, 149
production by Phytophthora parasitica, 359
Zscheile, F. P., Jr., (149), (883), (1405)
Zucker, M., (971)
Zygorhynchus spp., on alfalfa, effect of frequency of cutting, leaf spot, and K on, 1040

ERRATA, VOLUME 56

Page 272, Fig. 1 caption, line 4, *read* film exposed 2 months *for* film exposed 8 months.

Page 272, Fig. 1 caption, line 7, *read* after film exposure of 8 months *for* after film exposure of 2 months.

Page 1044, column 2, line 6, *read* Data for rhizosphere isolations showed that the number of *Fusarium* isolates obtained increased markedly as the frequency of cutting was increased and that the total number of isolates obtained also increased, though less markedly (Table 4) *for* Data for rhizosphere isolations showed that the number of *Fusarium* isolates obtained also increased, though less markedly (Table 4).

Phytopathology

An International Journal

Official Organ of

THE AMERICAN PHYTOPATHOLOGICAL SOCIETY

VOLUME 56

JANUARY-DECEMBER 1966

Editor-in-Chief

THOR KOMMEDAHL

Editors

D. F. BATEMAN
M. G. BOOSALIS
A. J. BRAUN
E. A. CURL
R. H. DAINES
V. H. DROPKIN
A. H. ELLINGBOE
A. W. FELDMAN
M. E. GALLEGLY
J. W. GERDEMANN
C. R. JACKSON
J. B. KENDRICK, JR.
T. KOSUGE
J. E. MITCHELL
R. S. PETERSON
I. R. SCHNEIDER
R. J. SHEPHERD
R. D. WILCOXSON

Business Management

D. H. MARSDEN

The American Phytopathological Society

Officers

GEORGE A. ZENTMYER, *President*
ARTHUR KELMAN, *President-Elect*
W. J. ZAUMEYER, *Retiring President*
H. H. FLOR, *Vice-President*
J. RALPH SHAY, *Secretary*
D. H. MARSDEN, *Treasurer*

Councilors

R. M. CALDWELL
J. E. MITCHELL
EDDIE ECHANDI
J. P. FULTON
KARL MARAMOROSCH
G. SEMENIUK
W. C. SNYDER
R. E. WEBB

PUBLISHED FOR THE SOCIETY

The Heffernan Press Inc.

Worcester, Massachusetts

DIVISIONS OF THE SOCIETY

Caribbean

GINO MALAGUTI, *Pres.*	ALBERT S. MULLER, *Vice-Pres.*	L. C. GONZALEZ, *Sec.-Treas.*

Northeastern

G. A. BRANDES, *Pres.*	R. M. GILMER, *Vice-Pres.*	J. R. BLOOM, *Sec.-Treas.*

North Central

M. B. LINN, *Pres.*	W. F. BUCHHOLTZ, *Vice-Pres.*	E. D. HANSING, *Sec.-Treas.*

Pacific

C. G. SHAW, *Pres.*	C. E. HORNER, *Vice-Pres.*	G. A. GRIES, *Sec.-Treas.*

Potomac

D. F. CROSSAN, *Pres.*	G. C. PAPAVIZAS, *Vice-Pres.*	C. A. THOMAS, *Sec.-Treas.*

Southern

J. H. OWEN, *Pres.*	T. T. HEBERT, *Vice-Pres.*	W. BIRCHFIELD, *Sec.-Treas.*

SUSTAINING ASSOCIATES

AGWAY, INC., Chemical Division, Ithaca, N.Y.

AMERICAN CYANAMID COMPANY, Princeton, N.J.

AMERICAN TOBACCO COMPANY, INC., Research Laboratory, 400 Petersburg Turnpike, Richmond 24, Va.

CALUMET & HECLA, INC., Calumet, Mich.

CAMPBELL SOUP COMPANY, Camden, N.J.

CIBA CORPORATION, P.O. Box 1105, Vero Beach, Fla.

THE DOW CHEMICAL COMPANY, Midland, Mich.

E. I. DU PONT DE NEMOURS & COMPANY, INC., Wilmington 98, Del.

ELI LILLY AND COMPANY, ELANCO PRODUCTS COMPANY DIVISION, Indianapolis, Ind.

FERRY-MORSE SEED COMPANY, P.O. Box 100, Mountain View, Calif.

H. J. HEINZ COMPANY, Pittsburgh 30, Pa.

MONSANTO CHEMICAL COMPANY, 800 N. Lindberg Boulevard, St. Louis 66, Mo.

NIAGARA CHEMICAL DIVISION, FMC CORPORATION, Middleport, N.Y.

ROHM AND HAAS COMPANY, Washington Square, Philadelphia 5, Pa.

SHELL CHEMICAL COMPANY, Agricultural Chemicals Sales Division, 110 West 51st Street, New York 20, N.Y.

TENNESSEE CORPORATION, 900 Roosevelt Highway, College Park, Ga.

YODER BROTHERS, INC., Barberton, Ohio

CONTENTS OF VOLUME 56, 1966

No. 1—JANUARY

REPORT OF THE 57TH ANNUAL MEETING OF THE AMERICAN PHYTOPATHOLOGICAL SOCIETY 1

NEW MEMBERS OF THE AMERICAN PHYTOPATHOLOGICAL SOCIETY 22

Effect of chain length of the alkyl quaternary ammonium compounds upon their use as systemic fungicides
L. V. EDGINGTON 23

Relation of soluble solids content and pith condition to Diplodia stalk rot in corn hybrids
DAVID S. WYSONG AND A. L. HOOKER 26

Relative tolerance of oat varieties to the crown rust fungus ..... M. D. SIMONS 36

Relationship of date of planting of oats to crown rust damage ..... M. D. SIMONS 41

Observations on the mode of infection of Pythium ultimum and Phytophthora cactorum on young roots of peach ..... C. R. MILLER, W. M. DOWLER, D. H. PETERSEN, AND R. P. ASHWORTH 46

A spore trap for studying spore release from basidiocarps ..... FRANCIS A. WOOD AND ROBERT A. SCHMIDT 50

Victoxinine production by Helminthosporium species .... SYOYO NISHIMURA, R. P. SCHEFFER, AND R. R. NELSON 53

Unaltered specificity in several xanthomonads after repeated passage through Phaseolus vulgaris
W. C. SCHNATHORST 58

Effect of diurnal temperature fluctuations on the charcoal root disease of Pinus lambertiana
RICHARD S. SMITH, JR. 61

Prunus effusa 'Krassa Severa' as a prune dwarf virus index host
R. O. HAMPTON, M. D. AICHELE, AND E. C. BLODGETT 65

Heat-induced susceptibility of soybeans to Phytophthora megasperma var. sojae, Phytophthora cactorum, and Helminthosporium sativum ..... D. W. CHAMBERLAIN AND J. W. GERDEMANN 70

Methods for evaluating inoculum density of Rhizoctonia in naturally infested soil
B. SNEH, J. KATAN, Y. HENIS, AND I. WAHL 74

Factors associated with resistance in barley to spot blotch ..... D. L. MUMFORD 79

High populations of Bacillus subtilis associated with phosphorus toxicity in soybeans
JOHN DUNLEAVY, J. F. KUNKEL, AND J. J. HANWAY 83

Host-parasite interactions of a root knot nematode and creeping bentgrass, Agrostis palustris
CLINTON F. HODGES AND DONALD P. TAYLOR 88

Effect of amino acids and sugars on growth of Diaporthe phaseolorum var. sojae in liquid culture
H. E. BLOSS AND H. W. CRITTENDEN 92

Overwintering of Phytophthora phaseoli ..... R. E. WESTER, R. W. GOTH, AND CHARLES DRECHSLER 95

Soil moisture and soil temperature, their influence on infection by the wheat flag smut fungus and control of the disease by three seed-treatment fungicides ..... LAURENCE H. PURDY 98

Reaction of Vicia species and F_5 hybrids from V. sativa × V. angustifolia to five root knot nematode species
NORMAN A. MINTON, E. D. DONNELLY, AND RAYMOND L. SHEPHERD 102

Nitrogen and carbon nutrition of Armillaria mellea in relation to growth-promoting effects of ethanol
A. R. WEINHOLD AND M. O. GARRAWAY 108

Temperature differentiation of genotypes for BV2 resistance in Pisum sativum
W. T. SCHROEDER, R. PROVVIDENTI, D. W. BARTON, AND W. MISHANEC 113

Role of proline and glutamic acid metabolism in spore germination of Rhizopus arrhizus .. DARRELL J. WEBER 118

Sources of infection in Verticillium wilt of rose ..... ROBERT D. RAABE AND STEPHEN WILHELM 124

A leaf spot of Bougainvillea caused by Cercospora bougainvilleae ..... E. K. SOBERS AND A. P. MARTINEZ 128

Influence of compounds with antitumor activity on crown gall ..... JOAN LANG AND RALPH BAKER 131

PHYTOPATHOLOGICAL NOTES

Influence of light on perithecial formation in Glomerella magna
N. N. WINSTEAD, S. F. JENKINS, JR., L. T. LUCAS, GEORGETTE J. CAMPBELL, AND H. T. BONE 134

Comparative survival of teliospores and mycelia of the onion smut fungus in soil
HIDEO TACHIBANA AND RUBEN DURAN 136

Synergistic effects of victorin and phytokinins on oat tissues ..... H. H. LUKE AND HARRY WHEELER 138

LETTER TO THE EDITOR ..... C. E. YARWOOD 140

BOOK LISTINGS 141

NEWS 142

No. 2—FEBRUARY

THE PRESIDENT'S COLUMN 143

REPORT AND ABSTRACTS OF THE 1965 ANNUAL MEETING OF THE PACIFIC DIVISION OF THE AMERICAN PHYTOPATHOLOGICAL SOCIETY 145

Pseudomonas caryophylli in carnation. II. Histological studies of infected plants
PAUL E. NELSON AND ROBERT S. DICKEY 154

Dark fixation of carbon dioxide by healthy and rust-affected leaves of wheat and bean
J. M. DALY AND A. LIVNE 164

Translocation in healthy and rust-affected beans ..... A. Livne and J. M. Daly 170
Effect of extracts from healthy and virus-infected apple and pear tissues on the growth of certain pathogenic fungi ..... George N. Agrios 176
Reaction of varieties and breeding lines of sericea lespedeza to five root knot nematode species
Norman A. Minton, E. D. Donnelly, and R. L. Shepherd 180
Growth response of Fusarium oxysporum f. tracheiphilum in vitro to varying oxygen and carbon dioxide tensions
R. W. Toler, P. D. Dukes, and S. F. Jenkins, Jr. 183
The role of 3-methyl-6-methoxy-8-hydroxy-3,4-dihydroisocoumarin in the resistance of carrot root to Ceratocystis fimbriata and Thielaviopsis basicola ..... Bobby A. Herndon, Joseph Kuć, and E. B. Williams 187
Electron microscopy of dark green spots on leaves of Nicotiana glutinosa induced by tobacco mosaic virus
T. Hayashi and C. Matsui 192
Production of perithecia by Gnomonia fructicola in culture ..... K. C. McOnie and W. C. Snyder 197
Simultaneous determination of fungistatic and fungicidal properties of chemicals
Dan Neely and E. B. Himelick 203
Inheritance of spontaneous mutations of the Victoria locus in oats
H. H. Luke, H. C. Murphy, and F. C. Petr 210
Survival of Cephalosporium gramineum in naturally infested wheat straws in soil in the field and in the laboratory ..... P. Lai and G. W. Bruehl 213
Verticillium wilt resistance in natural populations of Fragaria chiloensis in California
R. S. Bringhurst, Stephen Wilhelm, and Victor Voth 219
Attempts to alter infection processes and aggressiveness of Puccinia graminis var. tritici ... B. P. Chakravarti 223
Reduction of radiation resistance in fruit spoilage fungi by chemicals
S. G. Georgopoulos, B. Macris, and E. Georgiadou 230
Effects of a particular soil bacterium on sporangial production in Phytophthora cinnamomi in liquid culture
W. J. Manning and D. F. Crossan 235
Hydrolytic and trans-eliminative degradation of pectic substances by extracellular enzymes of Fusarium solani f. phaseoli ..... D. F. Bateman 238
Interactions of 3-indoleacetic acid and 3-hydroxytyramine in Fusarium wilt of banana
M. E. Mace and Elinor Solit 245

Phytopathological Note
A silica gel diffusion technique for determining fungal germination and growth responses to nutrients
R. L. Powelson and Joanna Pyott 248

Announcement by the Committee on Awards and Honors 250

News 251

No. 3—MARCH

Ernest M. Stoddard, 1889-1965 ..... A. E. Dimond 253
The role of the host in the development of disease symptoms—a review ..... Paul J. Allen 255
Quantitative changes in free and protein amino acids in leaves of healthy, Radopholus similis-infected, and "recovered" grapefruit seedlings ..... R. W. Hanks and A. W. Feldman 261
Effect of X-radiation on spore germination and stability of virulence in Ustilago avenae
C. S. Holton and R. A. Nilan 265
Evaluation of plant susceptibility to infection with bean yellow mosaic virus by aphid transmission
K. G. Swenson and R. E. Welton 269
Absorption and translocation of S^{35} in oat plants inoculated with labeled crown rust uredospores
John P. Jones 272
Effect of temperature on the growth of Rhizopus stolonifer on peaches and on agar .... Charles F. Pierson 276
Pectin lyase and polygalacturonase production by Rhizoctonia solani and other fungi .... R. T. Sherwood 279
Electrophoretic comparisons of soybean leaf proteins from varieties resistant and susceptible to Phytophthora megasperma var. sojae ..... James W. Hilty and A. F. Schmitthenner 287
Importance of lateral roots in Fusarium root rot of beans ..... D. W. Burke and A. W. Barker 292
Effect of plant injury on senescence of sorghum stalk tissue ..... A. J. Pappelis and R. A. Katsanos 295
Factors influencing spread of brown stem rot of soybeans ..... John Dunleavy 298
Colonization of wood by soil fungi ..... W. Merrill and D. W. French 301
Germination of conidia and formation of appressoria and secondary hyphae in Erysiphe graminis f. sp. tritici
Shawki S. Masri and Albert H. Ellingboe 304
Pathogenicity and morphology of isolates of Erysiphe polygoni ..... J. R. Stavely and E. W. Hanson 309
Effect of root knot and sting nematodes on expression of Fusarium wilt of cotton in three soils
Norman A. Minton and Earl B. Minton 319
Transmission of a ringspot-like virus from leaves of white ash ..... Craig R. Hibben 323
Biological effects of the reaction of Hg(II) with tobacco mosaic virus RNA and the reversal of this reaction
Vincent Santilli 326
Manometric studies on residue colonization in soil by Pythium aphanidermatum and Phytophthora parasitica
Richard B. Hine and Eduardo E. Trujillo 334

Physiology of germination of chlamydospores and endoconidia of Thielaviopsis basicola
D. E. Mathre and A. V. Ravenscroft 337

Phytopathological Notes

Oakleaf chlorosis symptomatic of cucumber mosaic virus infection in dahlia ..... Roger H. Lawson 343
Self-fertile red clover homozygous necrotic with bean yellow mosaic virus
Stephen Diachun and Lawrence Henson 345
Rapid isolation of single spores of fungi from dialysis tubing cellophane
J. Khair, G. Fleischmann, and A. Dinoor 346
Host reactions to citrus infectious variegation virus indicating wide diversity of virus strains
P. R. Desjardins and J. M. Wallace 347
Effect of a seed-pelleting treatment on grey speck of oats ..... B. Berkenkamp and D. K. McBeath 349
Additional hosts of Sclerophthora macrospora in South Dakota ..... G. Semeniuk and C. J. Mankin 351
Storage of culture media for laboratory and field use .... R. D. Watson, H. E. Carley, and Don M. Huber 352
Induction of chlamydospore formation by Fusarium solani in sterile soil extracts
J. V. Alexander, J. A. Bourret, A. H. Gold, and W. C. Snyder 353
Insect dissemination of the tomato race of Pseudomonas solanacearum, the cause of bacterial wilt of certain Musa species ..... Nader G. Vakili and Charles H. Baldwin, Jr. 355
Parasitic habit of Trichodorus christiei on wheat ..... C. C. Russell and V. G. Perry 357
Production of zoospore suspensions of Phytophthora parasitica ... Joseph M. Menyonga and Peter H. Tsao 359
Reaction of strawberry cultivars and clones of Fragaria chiloensis to six races of Phytophthora fragariae
H. S. Pepin and Hugh A. Daubeny 361
A new apple virus symptom ..... J. R. Shay 363
Effect of light on formation of lesions in Gomphrena globosa by red clover vein mosaic virus
Roy D. Wilcoxson and S. M. El-Kandelgy 364
Bacterial enhancement of self-limiting outgrowth formation on Datura
D. C. Hildebrand, J. P. Thompson, and M. N. Schroth 365
Inheritance of Rhizoctonia bottom rot resistance in cabbage ..... P. H. Williams and J. C. Walker 367
Effect of temperature on symptom expression of barley infected with aster yellows or barley yellow dwarf viruses ..... C. C. Gill and P. H. Westdal 369
Purification and electron microscopy of sugarcane mosaic virus
Thomas P. Pirone and Louis Anzalone, Jr. 371
Translocation of the antibiotic Phytoactin in western white pine seedlings ..... A. E. Harvey 373
Movement of conidia of Verticillium albo-atrum in cotton plants
John T. Presley, Harry R. Carns, Eldon E. Taylor, and W. C. Schnathorst 375

Letter to the Editor 376

News 377

No. 4—APRIL

Christos Plutarch Sideris, 1891-1965 ..... M. W. Gardner and P. D. Caldis 379
Fellows of The American Phytopathological Society 380
Primary infection of wheat and barley by Erysiphe graminis ..... Shawki S. Masri and Albert H. Ellingboe 389
Stem canker and blight of birdsfoot-trefoil and soybeans incited by Diaporthe phaseolorum var. sojae
Marvin D. Whitehead 396
Effect of pH and carbon and nitrogen sources on the growth of Verticillium albo-atrum
I. Malca, D. C. Erwin, W. Moje, and Barbara Jones 401
Effect of oxygen concentration on Pythium seed rot of soybean ..... G. Eldon Brown and B. W. Kennedy 407
Influence of moisture content, temperature, and time on invasion of soybeans by storage fungi
C. M. Christensen and C. E. Dorworth 412
Separation of U-1 and U-2 strains of tobacco mosaic virus by continuous free-flow electrophoresis
David G. Streeter and Milton P. Gordon 419
Factors affecting the antigenicity of the mycelium of three species of Phytophthora
R. G. Burrell, C. W. Clayton, M. E. Gallegly, and V. G. Lilly 422
Behavior of Verticillium dahliae in the rhizosphere and on roots of plants susceptible, resistant, and immune to wilt ..... M. L. Lacy and C. E. Horner 427
Latent infection of Gomphrena globosa by potato virus X ..... J. E. Huguelet and W. J. Hooker 431
Scion and rootstock as factors in the development of citrus nematode populations
J. D. Kirkpatrick and S. D. Van Gundy 438
A quasi-parasite of bean pods: Fusarium oxysporum ..... R. W. Goth 442
Relation of periderm formation and callose deposition to anthracnose resistance in papaya fruit
Michael E. Stanghellini and Minoru Aragaki 444
Relative resistance of Pickett soybeans to various strains of Heterodera glycines
Charles A. Brim and J. P. Ross 451

PHYTOPATHOLOGICAL NOTES

A leaf spot disease of azalea and hydrangea caused by Corynespora cassiicola ..... E. K. SOBERS 455
Galactia sp. as a local lesion host for the pea enation mosaic virus
KERAMAT IZADPANAH AND R. J. SHEPHERD 458
Dissemination of the Verticillium wilt fungus with cotton seed.... G. EVANS, S. WILHELM, AND W. C. SNYDER 460
Ribonuclease-sensitive infectious units from Wisconsin pea streak virus
J. N. C. MADUEWESI AND D. J. HAGEDORN 462
An apparatus for obtaining fluid from xylem vessels ..... GAROLD F. GREGORY 463
Role of injury and longevity of Erwinia amylovora in the epidemiology of fire blight of pear
HARRY L. KEIL, BERNARD C. SMALE, AND ROY A. WILSON 464
Carbon filter prevents ozone fleck and premature senescence of tobacco leaves
H. A. MENSER, JR., H. E. HEGGESTAD, AND J. J. GROSSO 466
Relationship of cell death patterns and spread of Colletotrichum graminicola in sorghum stalk tissue
R. A. KATSANOS AND A. J. PAPPELIS 468

NEWS 470

BOOK LISTINGS 471

No. 5—MAY

Jacquelin S. Cooley, 1883-1965 ..... LACY P. MCCOLLOCH 473
Some biological and physical properties of a midwestern isolate of maize dwarf mosaic virus
J. B. BANCROFT, A. J. ULLSTRUP, MIMI MESSIEHA, C. E. BRACKER, AND T. E. SNAZELLE 474
Effect of sugars on germination and metabolism of teliospores of Ustilago maydis
PAUL G. CALTRIDER AND DAVID GOTTLIEB 479
Fungitoxicity of some thiosemicarbazones ..... S. K. ADDY AND G. N. MITRA 485
Histology of resistant and susceptible seedlings of Tephrosia vogelii inoculated with Phytophthora parasitica var. nicotianae ..... E. G. RUPPEL 489
Effect of mineral nutrition on host reaction to Cladosporium fulvum ..... S. A. GHABRIAL AND T. P. PIRONE 493
An antibacterial substance from cauliflower seeds ..... F. MALEKZADEH 497
Symptoms resembling virus infection induced by high temperature in Nicotiana glutinosa
V. T. JOHN AND M. WEINTRAUB 502
Kernel infection of Bluebonnet 50 rice by Helminthosporium oryzae ..... S. F. IMAM FAZLI AND H. W. SCHROEDER 507
Heat predisposition to corn rust ..... C. E. YARWOOD AND A. L. HOOKER 510
Field tests with oil sprays for the prevention of cucumber mosaic virus in cucumbers
G. LOEBENSTEIN, MIRIAM DEUTSCH, H. FRANKEL, AND Z. SABAR 512
A new 24-hour spore sampler ..... C. L. KRAMER AND S. M. PADY 517
A cytochemical study of hypertrophy in clubroot of cabbage ..... PAUL H. WILLIAMS 521
Races of Fusarium oxysporum f. conglutinans; race 4, new race; and a new host for race 1, Lychnis chalcedonica
G. M. ARMSTRONG AND JOANNE K. ARMSTRONG 525
Incidence of hypocotyl collar rot of Phaseolus vulgaris in the field and in germination tests
F. J. WILLIAMS, W. L. HOLLIS, AND M. H. DAY 531
Culture of Puccinia sorghi on detached leaves of corn and Oxalis corniculata
A. L. HOOKER AND C. E. YARWOOD 536
Cellular responses of Hibiscus esculentus to Meloidogyne incognita acrita ..... R. H. LITTRELL 540
Aerobiology of Fusarium roseum 'Gibbosum' associated with crown rot of boxed bananas
F. L. LUKEZIC AND W. J. KAISER 545
Effect of antifungal properties of soil on dissemination of the pathogen and seedling infection originating from Verticillium-infected achenes of Senecio ..... B. SCHIPPERS AND A. K. F. SCHERMER 549
Ghost spot of apple leaves caused by Alternaria tenuis ..... JACK TAYLOR 553
Effect of heat treatment on the raspberry mosaic virus complex in Latham red raspberry .. R. H. CONVERSE 556

PHYTOPATHOLOGICAL NOTES

An inhibitor of potato virus X in potato plants infected with Phytophthora infestans
W. A. HODGSON AND JAMES MUNRO 560
Inability of peach yellow bud mosaic virus and C^{14} to move into opposite noninoculated primary leaves of cowpea ..... H. P. KARLE AND T. A. SHALLA 562
Development of a new medium for culturing Dothidella ulei in quantity ..... K. R. LANGDON 564
Alfalfa cotyledon inoculation with bacterial wilt inoculum prepared from infected alfalfa roots
F. I. FROSHEISER 566
Natural and experimental infection of Rubus with strawberry necrotic shock virus ..... N. W. FRAZIER 568
A system for storing rust spores in liquid nitrogen ..... K. T. LEATH, R. W. ROMIG, AND J. B. ROWELL 570
Pseudo mild yellow edge: a new strawberry virus disease in the Fragaria virginiana indicator clone M_1
N. W. FRAZIER 571
Parasitism of Trichodorus christiei on cotton seedlings ..... S. A. ALHASSAN AND J. P. HOLLIS 573

67 -98A A 30

Mechanical transmission of tatter leaf virus from cowpea to citrus ..... ROBERT W. FULTON 575
A quantitative method for assaying soil fungistasis ..... C. I. CHACKO AND J. L. LOCKWOOD 576
Induction of non-hyperplastic galls by living and heat-killed phytopathogenic bacteria
L. LOVREKOVICH AND G. LOEBENSTEIN 578
Cyclic production of pycnidia and spores in dead wheat tissue by Septoria nodorum ..... A. L. SCHAREN 580
NEWS 582

No. 6—JUNE

REPORT AND ABSTRACTS OF THE 1966 ANNUAL MEETING OF THE POTOMAC DIVISION OF THE AMERICAN PHYTOPATHOLOGICAL SOCIETY 583
Resistance of mature leaves of Malus atrosanguinea 804 to Venturia inaequalis and Helminthosporium carbonum
W. L. BIEHN, E. B. WILLIAMS, AND J. KUČ 588
Inoculum increase of the Verticillium wilt fungus in cotton ..... G. EVANS, W. C. SNYDER, AND S. WILHELM 590
Lysis of fungal hyphae in soil and its possible relation to autolysis ..... A. B. LLOYD AND JOHN L. LOCKWOOD 595
The polygalacturonase of Pyrenochaeta terrestris ..... N. T. KEEN AND J. C. HORTON 603
Decarboxylation of indoleacetic acid by near-isogenic lines of wheat resistant or susceptible to Puccinia graminis f. sp. tritici ..... E. ANTONELLI AND J. M. DALY 610
Comparison of hard red spring and winter wheats in storage ..... D. B. SAUER AND C. M. CHRISTENSEN 619
A system for the determination of races of Plasmodiophora brassicae that infect cabbage and rutabaga
PAUL H. WILLIAMS 624
Ultrastructure of host-parasite relationships involving reproduction of Bdellovibrio bacteriovorus in host bacteria
RONALD H. SCHERFF, JAMES E. DEVAY, AND THOMAS W. CARROLL 627
Salt injury to trees. II. Sodium and chloride in roadside sugar maples in Massachusetts
F. W. HOLMES AND J. H. BAKER 633
Susceptibility of certain Potentilla and Geum species to infection by various races of Phytophthora fragariae
R. H. CONVERSE AND J. N. MOORE 637
Effect of soil temperature on resistance of rice to seedling blight caused by Sclerotium rolfsii
P. WEERAPAT AND H. W. SCHROEDER 640
Purification of the bean red node strain of tobacco streak virus
G. I. MINK, K. N. SAKSENA, AND M. J. SILBERNAGEL 645
Probabilities of failing to detect prune dwarf virus in cherry trees by bud indexing ..... R. O. HAMPTON 650
Varietal reaction of alfalfa to Phytophthora megasperma and variation in virulence of the causal fungus
DONALD C. ERWIN 653
Transmission of tomato ringspot, peach yellow bud mosaic, and grape yellow vein viruses by Xiphinema americanum ..... DANIEL TÉLIZ, R. G. GROGAN, AND B. F. LOWNSBERY 658
Breeding wheat for resistance to soil-borne wheat mosaic virus, wheat streak-mosaic virus, leaf rust, stem rust, and bunt ..... M. I. SHAALAN, E. G. HEYNE, and W. H. SILL, JR. 664
On the nature of changes in peroxidase isoenzymes in bean leaves infected by southern bean mosaic virus
G. L. FARKAS AND MARK A. STAHMANN 669
Source of black shank resistance in tobacco and host reaction to races 0 and 1 of Phytophthora parasitica var. nicotianae ..... G. W. STOKES AND C. C. LITTON 678
Inheritance of tolerance to halo blight in bean ..... P. N. PATEL AND J. C. WALKER 681
Major genes for resistance and the formation of secondary hyphae by Erysiphe graminis f. sp. hordei
MARY S. MCCOY AND ALBERT H. ELLINGBOE 683
Reaction of kenaf, roselle, and related species of Hibiscus to root knot nematodes
F. D. WILSON AND T. E. SUMMERS 687
Nematocidal and fungicidal properties of some soil fumigants
R. C. BAINES, L. J. KLOTZ, T. A. DEWOLFE, R. H. SMALL, AND G. O. TURNER 691
Fusarium oxysporum f. cassiae form. nov., causal agent of wilt of Cassia tora and other plants
G. M. ARMSTRONG AND JOANNE K. ARMSTRONG 699
Phototropism by conidiophores of Cercospora beticola ..... L. CALPOUZOS AND G. F. STALLKNECHT 702
Cytological abnormalities induced by high temperature in Nicotiana glutinosa .. M. WEINTRAUB AND V. T. JOHN 705
Saprophytism and persistence in soil by Phytophthora cinnamomi ... GEORGE A. ZENTMYER AND S. M. MIRCETICH 710
Rooting failure of chrysanthemum cuttings resulting from excess sodium or potassium
ROBERT D. RAABE AND J. VLAMIS 713
PHYTOPATHOLOGICAL NOTES
In vitro production of toxin by Dothidella ulei ..... J. W. MILLER 718
Endospores in Scirrhia acicola ..... EMORY S. CROSBY 720
Relation of exudates of pea roots to germination of spores in races of Fusarium oxysporum f. pisi
THOR KOMMEDAHL 721
ANNOUNCEMENT 723
NEWS 724

No. 7—JULY

THE PRESIDENT'S COLUMN 725
Bacteriophages of Pseudomonas atrofaciens in cereal seeds ..... M. D. SUTTON 727
Virus activity and growth of infected and healthy callus tissues of Nicotiana tabacum grown in vitro
RICHARD A. REINERT 731
Growth and polygalacturonase production by Rhizopus stolonifer ..... R. A. CAPPELLINI 734
Purification and characterization of California tobacco rattle virus .... GUSTAAF A. DE ZOETEN AND T. A. SHALLA 738
California tobacco rattle virus, its intracellular appearance, and the cytology of the infected cell
GUSTAAF A. DE ZOETEN 744
Host-parasite relationships of the root knot nematode in edible ginger ..... CHAW-SHUNG HUANG 755
A blight of Lotus corniculatus caused by a new species of Phomopsis ..... JANESHWAR UPADHYAY 760
Prior-colonization as a factor in the saprophytic survival of several fungi in wheat straw
G. W. BRUEHL AND PHIL LAI 766
Pathological changes in Agropyron smithii induced by Anguina agropyronifloris
DON C. NORTON AND JOHN E. SASS 769
Appraisal of Hypoxylon punctulatum as a biological control agent of Ceratocystis fagacearum in oak-wilt trees
TERRY C. DAVIS 772
Associative effects of fungi on Cochliobolus sativus ..... L. E. TYNER 776
Fusarium blight of turfgrasses ..... HOUSTON B. COUCH AND ELLIS R. BEDFORD 781
Effect of temperature during uredospore production and of light on in vitro germination of uredospores from Puccinia striiformis ..... H. TOLLENAAR AND BYRON R. HOUSTON 787
Factors related to disease development in birdsfoot-trefoil caused by Phomopsis loti ... JANESHWAR UPADHYAY 791
Identification and maintenance of races of Erysiphe polygoni from Trifolium pratense
J. R. STAVELY AND E. W. HANSON 795
Nutrient mobilization in leaves by Puccinia recondita
LOWELL B. JOHNSON, JOHN F. SCHAFER, AND A. C. LEOPOLD 799
A new form and two new hosts of Puccinia iridis in Florida ..... E. K. SOBERS 804
Detection of urediospores of wheat rusts in spring rains ..... J. B. POWELL AND R. W. ROMIG 807
Variability in the genus Phytophthora. II. Effects of vitamins on growth ..... H. RONALD CAMERON 812
Histopathology of root knot nematode-infected peony roots ..... H. E. EVERSMEYER AND O. J. DICKERSON 816
Cell irritability and localization of vascular infections in plants ..... C. H. BECKMAN 821
Cross-infection in Fusarium wilt diseases ..... DAVID DAVIS 825
Effect of planting date on stalk rot susceptibility and cell death in corn ..... A. J. PAPPELIS AND L. V. BOONE 829
Effect of red clover flower extract and glucose on infection of Gomphrena globosa by red clover vein mosaic virus
S. M. EL-KANDELGY AND ROY D. WILCOXSON 832
Cell inclusions in herbaceous hosts of an apple virus ..... DONALD E. HARDER AND HUGH C. KIRKPATRICK 838
Effects of beet western yellows and lettuce mosaic viruses on lettuce seed production, flowering time, and other characters in the greenhouse ..... EDWARD J. RYDER AND JAMES E. DUFFUS 842
Nutritional requirements of isolates of Erwinia amylovora
A. F. EL-HELALY, M. K. ABO-EL-DAHAB, AND M. A. EL-GOORANI 845
Effects of soil fertility on cell death in corn stalk tissue ..... A. J. PAPPELIS AND L. V. BOONE 850
Cereal smut or bunt in 16th Century herbals ..... STEPHEN WILHELM AND HELGA TIETZ 853

PHYTOPATHOLOGICAL NOTES

Colonization and survival of Bremia lactucae in lettuce ... R. B. MARLATT, R. T. MCKITTRICK, AND R. W. LEWIS 856
Recovery of pea streak virus from pea seed parts and its transmission by immature seed .. RICHARD E. FORD 858
Simple method of disruption and enzyme extraction from rust uredospores
P. D. RICK, L. P. BUSH, AND C. J. MIROCHA 860
Simultaneous association of strains of tobacco ringspot virus within Xiphinema americanum ... NADA I. SAUER 862
Factors affecting sporulation of the rice blast fungus, Pyricularia oryzae .. HAJIME KATO AND A. E. DIMOND 864

NEWS 866

No. 8—AUGUST

THE PRESIDENT'S COLUMN 867

BOOK LISTINGS 868

ABSTRACTS OF PAPERS ACCEPTED FOR PRESENTATION AT THE FIFTY-EIGHTH ANNUAL MEETING OF THE AMERICAN PHYTOPATHOLOGICAL SOCIETY, DENVER, COLORADO, 20-24 AUGUST 1966 869

Sugar repression of endopolygalacturonase and cellulase synthesis during pathogenesis by Pyrenochaeta terrestris as a resistance mechanism in onion pink root ..... J. C. HORTON AND N. T. KEEN 908

Factors affecting growth and development of Aphanomyces euteiches ..... J. E. MITCHELL AND C. Y. YANG 917

Cytological and fine-structure studies of Aphanomyces euteiches
M. N. Shatla, C. Y. Yang, and J. E. Mitchell 923
Effect of fumigants and plastic film on the control of several soil-borne pathogens of tomato
John Paul Jones, A. J. Overman, and C. M. Geraldson 929
Translocation of twelve fungicidal compounds injected into trees of Prunus domestica
A. W. Helton and K. G. Rohrbach 933
Some effects of temperature and relative humidity on development of Erysiphe polygoni on Trifolium pratense
J. R. Stavely and E. W. Hanson 940
A comparison of the sensitivity of three serological tests for plant viruses and other antigens
N. S. Wright and R. Stace-Smith 944
Airborne conidia of Helminthosporium turcicum in Nebraska ..... Donald S. Meredith 949
Mechanisms of biological control in a bean root rot soil .... D. M. Huber, A. L. Andersen, and A. M. Finley 953
Some basic differences in the reactions of resistant and susceptible Trifolium pratense to Erysiphe polygoni
J. R. Stavely and E. W. Hanson 957
Characteristics of respiration by conidia of Verticillium albo-atrum
Mary Kay Bechtol and G. O. Throneberry 963
Deactivation of sodium *N*-methyldithiocarbamate in soil by nematocides containing halogenated hydrocarbons
P. M. Miller and R. J. Lukens 967
Biosynthesis of chlorogenic acid in potato roots resistant and susceptible to Verticillium albo-atrum
Suresh S. Patil, M. Zucker, and A. E. Dimond 971
Degradation of pectic substances associated with pathogenesis by Sclerotinia sclerotiorum in sunflower and tomato stems ..... J. G. Hancock 975
A microenvironment chamber for critical control of relative humidity ..... W. E. Rogers 980

Phytopathological Notes
Kernel infection and corn stalk rot caused by Fusarium moniliforme
T. A. Kucharek and Thor Kommedahl 983
Calcium and water-insoluble pectic substances in safflower hypocotyls in relation to Phytophthora drechsleri ..... C. A. Thomas 985
Changes in pigment, phosphorus-32, and starch in unifoliolate leaves of soybeans infected by Cercospora sojina ..... L. A. Fucikovsky 987
Diurnal periodicity and violent liberation of conidia in Epicoccum ..... Donald S. Meredith 988
Induction of bacterial canker of peach in the field ..... William M. Dowler and D. H. Petersen 989
News 991

No. 9—SEPTEMBER

Ancell Byron Groves, 1904-1966 ..... S. A. Wingard 993
Ernest A. Lungren, 1899-1965 ..... L. W. Durrell 994
Pathogenicity of Pratylenchus penetrans and Tylenchorhynchus claytoni on turfgrasses
J. Troll and R. A. Rohde 995
Comparative carbohydrate catabolism in three different pathogenic strains of Pseudomonas solanacearum
I. W. Buddenhagen, Kay R. Kennedy, and C. H. Wang 999
Effect of kernel infection of rice by Helminthosporium oryzae on yield and quality
S. F. Imam Fazli and H. W. Schroeder 1003
Polygalacturonate trans-eliminase and polygalacturonase production by Rhizoctonia solani
W. A. Ayers, G. C. Papavizas, and A. F. Diem 1006
Chlamydospores of Thielaviopsis basicola as surviving propagules in natural soils
Peter H. Tsao and J. L. Bricker 1012
Rapid kill of nematodes in flooded soil ..... John P. Hollis and R. Rodriguez-Kabana 1015
Mechanical transmission of onion yellow dwarf virus ..... Raymond Louie and James W. Lorbeer 1020
Effect of nutrients on nematode activity on azalea ..... K. R. Barker and G. L. Worf 1024
Transmission of two strains of cucumber and alfalfa mosaic viruses by single aphids of Myzus persicae
Manolo B. Castillo and Gert B. Orlob 1028
The water content of powdery mildew conidia ..... E. Somers and J. G. Horsfall 1031
In vitro germination of uredospores of Puccinia graminis and P. striiformis at low spore densities
H. Tollenaar and Byron R. Houston 1036
Root rot and root microflora of alfalfa as affected by potassium nutrition, frequency of cutting, and leaf infection ..... C. J. O'Rourke and R. L. Millar 1040
Role of certain soil factors in the etiology of corky root rot of lettuce ..... K. S. Amin and Luis Sequeira 1047
Phytotoxic substances from decomposing lettuce residues in relation to the etiology of corky root rot of lettuce
K. S. Amin and Luis Sequeira 1054
Toxemia of halo blight of beans ..... H. A. J. Hoitink, R. L. Pelletier, and J. G. Coulson 1062
Induced immunity to Ceratocystis infection in sweetpotato root tissue
Darrell J. Weber and Mark A. Stahmann 1066

Suppression of Aphanomyces root rot of peas by cruciferous soil amendments ..... GEORGE C. PAPAVIZAS 1071
Production of oospores and chlamydospores of Phytophthora cinnamomi in roots and soil
S. M. MIRCETICH AND G. A. ZENTMYER 1076
Effect of probing behavior and starvation of Myzus persicae on transmission of bean common mosaic virus
F. W. ZETTLER AND R. E. WILKINSON 1079
Role of nitrogen in wood deterioration: amount and distribution of nitrogen in fungi
W. MERRILL AND ELLIS B. COWLING 1083
Root and butt rot in young yellow-poplar stump sprouts ..... J. W. BYLER AND R. P. TRUE 1091
Mycelial growth rate and sporulation of Alternaria tenuis, Botrytis cinerea, Cladosporium herbarum, and Rhizopus stolonifer in low-oxygen atmospheres ..... M. N. FOLLSTAD 1098

PHYTOPATHOLOGICAL NOTES

Calonectria nivalis, perfect stage of Fusarium nivale, occurs in the field in North America
R. JAMES COOK AND G. W. BRUEHL 1100
An efficient device for the rapid collection of fungal spores from infected plants
EDWARD CHERRY AND CLYDE E. PEET 1102
Association of Aspergillus flavus and aflatoxins with a greenish yellow fluorescence of cotton seed
L. J. ASHWORTH, JR. AND J. L. MCMEANS 1104
Effect of temperature on development of black scale symptoms of easter lily bulbs ..... E. K. SOBERS 1106
Influence of red and far-red light on virus content of callus tissues cultured from Nicotiana tabacum
R. A. REINERT AND M. J. KASPERBAUER 1108
Anastomosis in Verticillium albo-atrum in soil ..... LAWRENCE R. SCHREIBER AND RALPH J. GREEN, JR. 1110
Pectate lyase production by Colletotrichum trifolii in relation to changes in pH..... J. G. HANCOCK 1112
Susceptibility of acerola to Cercospora leaf spot ..... O. V. HOLTZMANN AND M. ARAGAKI 1114
Spot-plate technique for the bioassay of Cylindrocladium scoparium ..... W. G. THIES AND R. F. PATTON 1116

NEWS 1118

No. 10—OCTOBER

C. O. Johnston, 1893-1965 ..... L. E. BROWDER AND E. G. HEYNE 1119
Penetration and development of Verticillium albo-atrum in the cotton plant
R. H. GARBER AND BYRON R. HOUSTON 1121
Transmission and host range of the tomato yellow leaf curl virus ..... S. COHEN AND F. E. NITZANY 1127
Effect of Trichoderma viride, Fusarium oxysporum, and fungal enzymes upon the penetration of alfalfa roots by Pratylenchus penetrans ..... J. E. EDMUNDS AND W. F. MAI 1132
Symptoms and host-parasite relations in the tar spot disease of Lespedeza caused by Phyllachora lespedezae
JULIO H. LÓPEZ-ROSA AND R. T. SHERWOOD 1136
Comparison of methods of analysis of field collections of Puccinia recondita f. sp. tritici
A. P. ROELFS AND C. O. JOHNSTON 1143
Amino acid composition of a crystalline host-specific toxin ..... R. B. PRINGLE AND R. P. SCHEFFER 1149
Multiplication of Xanthomonas vesicatoria and lesion development in resistant and susceptible pepper
R. E. STALL AND A. A. COOK 1152
Host range and differentiation of a severe form of Verticillium albo-atrum in cotton
W. C. SCHNATHORST AND D. E. MATHRE 1155
Invasion by fungi of rice stored at moisture contents of 13.5 to 15.5% .... H. A. FANSE AND C. M. CHRISTENSEN 1162
Xylem sap as a growth medium for four tree wilt fungi ..... KENNETH J. KESSLER, JR. 1165
Changes in concentrations of nitrogen and free and bound amino acids in alfalfa and pea infected by Ditylenchus dipsaci ..... ROBERT K. HOWELL AND L. R. KRUSBERG 1170
Effects of the pathotoxin victorin on ultrastructure of root and leaf tissue of Avena species
H. H. LUKE, H. E. WARMKE, AND PENELOPE HANCHEY 1178
Distribution of C^{14} in the potato plant in relation to leaf infection by Phytophthora infestans
M. O. GARRAWAY AND R. L. PELLETIER 1184
Purification and properties of two isolates of tobacco rattle virus from pepper in California ... J. S. SEMANCIK 1190
Bacterial spot development in excised pepper and tomato leaves at several temperatures ... DONALD J. MORTON 1194
Effect of leaching on victorin-induced respiration of oat tissue ..... E. J. AMADOR AND HARRY WHEELER 1196
Response of conidia and appressoria of Gloeosporium musarum to hypochlorous acid ..... G. L. GREENE 1201
Cross-protection in cotton with strains of Verticillium albo-atrum .... W. C. SCHNATHORST AND D. E. MATHRE 1204

PHYTOPATHOLOGICAL NOTE

Aphid transmission of beet yellows virus inhibited by mineral oil ..... J. VANDERVEKEN AND J. SEMAL 1210

NEWS 1212

No. 11—NOVEMBER

The role of Thielaviopsis basicola as a primary cause of yield reduction in cotton in California
D. E. Mathre, A. V. Ravenscroft, and R. H. Garber 1213

Inheritance of resistance to stem rot and to root knot nematode in sweetpotato
F. Ben Struble, Lou S. Morrison, and H. B. Cordner 1217

Fluctuation in amount of starch in host plants invaded by rust and mildew fungi .. C. J. Mirocha and A. I. Zaki 1220

Chemotaxonomic studies on Ustilago avenae and Ustilago kolleri ..... Avdhesh Narain 1225

Relation of root necrosis caused by Pythium species to peach tree decline
Floyd F. Hendrix, Jr., W. M. Powell, and J. H. Owen 1229

Purification of barley stripe mosaic virus with chloroform and charcoal
Roland G. Timian and Scott M. Savage 1233

Inhibitory effect of Blasticidin S on tobacco mosaic virus multiplication
T. Hirai, A. Hirashima, T. Itoh, T. Takahashi, T. Shimomura, and Y. Hayashi 1236

Variation of Armillaria mellea in culture ..... Robert D. Raabe 1241

Mechanical transmission of aphid-borne raspberry viruses to herbaceous hosts .... C. C. Bernier and T. H. King 1245

Nonpersistence of the tungro virus of rice in its leafhopper vector, Nephotettix impicticeps ..... K. C. Ling 1252

Scurf development in sweetpotatoes as affected by length of the slender attachment root
W. J. Martin and Teme P. Hernandez 1257

Behavior of single-basidiospore isolates and heterokaryons of Rhizoctonia solani from flax
Raul Garza-Chapa and Neil A. Anderson 1260

Polygalacturonate trans-eliminase production by Fusarium oxysporum and Fusarium solani
G. C. Papavizas and W. A. Ayers 1269

Effect of high postinoculation temperature on colonization of lima bean stems by Phytophthora phaseoli
R. A. Hyre 1274

Roses and blackspot. I. Pathogenicity to excised leaflets of Diplocarpon rosae from seven geographic locations
J. G. Palmer, P. Semeniuk, and R. N. Stewart 1277

Roses and blackspot. II. Seasonal variation in host susceptibility and decline of virulence in culture of conidia from Diplocarpon rosae ..... J. G. Palmer, P. Semeniuk, and R. N. Stewart 1283

Mobilization of minerals to the infection site of root knot nematodes ..... G. B. Bergeson 1287

Influence of certain environmental conditions on spore dispersal and survival of Cercospora hayi from banana
W. J. Kaiser and F. L. Lukezic 1290

Environmental factors affecting growth and sporulation of Helminthosporium vagans and its pathogenicity to Poa pratensis ..... Philip M. Halisky and C. Reed Funk 1294

Production of disease in Helminthosporium victoriae with phenol extracts of diseased and normal mycelia
G. D. Lindberg 1297

A comparison of pathogenic isolates of Fusarium oxysporum f. lycopersici and different sources of resistance in tomato ..... Matteo Cirulli and Leonard J. Alexander 1301

Histological study of the resistance of Zea mays to Puccinia graminis ..... K. T. Leath and J. B. Rowell 1305

Phytopathological Notes

Preparation of macromolecular antigens from Fomes annosus ..... G. V. Gooding, Jr. 1310

Modification of growth substances in burrowing nematode-infected citrus trees
A. W. Feldman, R. W. Hanks, and R. J. Collins 1312

Observations on Cercosporella herpotrichoides in soil ..... Ralph S. Byther and R. L. Powelson 1314

Effect of light on the germination of Uromyces phaseoli uredospores ..... C. R. Curtis 1316

Nonretention of two semipersistent strawberry viruses through ecdysis by their aphid vector
N. W. Frazier 1318

Population increase of Pratylenchus penetrans in alfalfa and celery roots infected with Trichoderma viride
J. E. Edmunds and W. F. Mai 1320

Production of macroconidia of Fusarium oxysporum f. batatas and their conversion to chlamydospores
Edward R. French and L. W. Nielsen 1322

Role of nitrogen in wood deterioration. IV. Relationship of natural variation in nitrogen content of wood to its susceptibility to decay ..... W. Merrill and Ellis B. Cowling 1324

Abjection of secondary sporidia of Cronartium fusiforme ..... Thomas Miller and Ronald W. Roncadori 1326

Long-term storage of purified southern bean mosaic virus freeze-dried in the presence of lactose
J. F. Worley and I. R. Schneider 1327

Storage and germination of aeciospores of Cronartium fusiforme
R. W. Roncadori and F. R. Matthews 1328

Dosage-response relationships in diphenyl tolerance of Hypomyces
Vassiliki E. Vomvoyanni and S. G. Georgopoulos 1330

Effect of four herbicides on growth of Rhizoctonia solani
R. Rodriguez-Kabana, E. A. Curl, and H. H. Funderburk, Jr. 1332

Starch gel electrophoresis of proteins from species of Phytophthora ..... B. G. Clare and G. A. Zentmyer 1334

Yam-dextrose agar for cultivation of fungi in the Tropics ..... J. N. C. Maduewesi and E. E. Nwauzo 1336

News 1338

No. 12—DECEMBER

Low-oxygen atmospheres for control of postharvest decay of fresh strawberries
H. Melvin Couey, M. N. Follstad, and M. Uota 1339

Local infection of sorghum by the Johnson grass loose kernel smut fungus ..... Jack L. Dean 1342

Heat pasteurization for control of postharvest decay in fresh strawberries
H. Melvin Couey and Merle N. Follstad 1345

Lesion development and distribution of tobacco mosaic virus in Datura stramonium .. Thomas W. Carroll 1348

Reactions of safflower to lettuce mosaic virus ..... J. M. Klisiewicz 1354

Effect of ultraviolet light on Erysiphe graminis f. sp. hordei ..... J. G. Moseman and L. W. Greeley 1357

A peg, pod, and root necrosis of peanuts caused by a species of Calonectria ... D. K. Bell and E. K. Sobers 1361

Chemotaxis of zoospores of Aphanomyces cochlioides to sugar beet seedlings
Palthad Vittal Rai and Gary A. Strobel 1365

Resistance of Capsicum annuum 'Italian El' to infection with potato virus Y ..... John N. Simons 1370

Evaluation of generalized curves for number of cereal rust uredospores trapped on slides
R. W. Romig and V. A. Dirks 1376

Serological comparisons of Erwinia nigrifluens with certain other Erwinia species
Fakhery M. Zeitoun and E. E. Wilson 1381

Synergism between Pythium ultimum and cucumber mosaic virus ..... Franco E. Nitzany 1386

Aflatoxin production by isolates of Aspergillus flavus ..... Urban L. Diener and Norman D. Davis 1390

Chenopodium quinoa, a local lesion assay host for potato virus Y .... S. Delgado-Sanchez and R. G. Grogan 1394

Purification and properties of potato virus Y ..... S. Delgado-Sanchez and R. G. Grogan 1397

Protein and enzyme changes in barley leaves infected with Erysiphe graminis f. sp. hordei
Lowell B. Johnson, B. L. Brannaman, and F. P. Zscheile, Jr. 1405

Phytopathological Notes

Pythium species still viable after 12 years in air-dried muck soil ..... Paul E. Hoppe 1411

A method of locating penetration sites in plant tissues for electron microscopy
J. R. Stavely and E. W. Hanson 1412

Microflora of nonprocessed raisins ..... Merle N. Follstad 1413

Pectic enzymes of Pseudomonas marginalis ..... Seiichi Nasuno and Mortimer P. Starr 1414

Necrosis of hyphae of Fusarium solani f. phaseoli and Rhizoctonia solani induced by a soil-borne bacterium
Don M. Huber and Axel L. Andersen 1416

Vegetative growth of Puccinia graminis f. sp. tritici in vitro
P. G. Williams, K. J. Scott, and Joy L. Kuhl 1418

Comparative transmission of cucumber mosaic virus acquired by aphids from plants or through a membrane ..... El-Sayed Megahed and Thomas P. Pirone 1420

A serological comparison of maize dwarf mosaic virus isolates ..... Grant W. Wagner and J. L. Dale 1422

Protease activity in diseased fruits ..... F. M. Porter 1424

Ratoon stunting disease virus. Assay technique and partial purification
A. G. Gillaspie, Jr., J. E. Irvine, and R. L. Steere 1426

Reaction of one barley plant to several cultures of Erysiphe graminis f. sp. hordei
J. G. Moseman and L. W. Greeley 1428

Interference of low temperature with the control of tomato early blight through use of nocturnal illumination ..... R. J. Lukens 1430

Effect of suspending media on the survival of Puccinia graminis urediospores during freezing
E. E. Davis, F. A. Hodges, and R. D. Goos 1432

News 1434

Book Listings 1435

Index for 1966 i

Errata xxxii

Tables of Contents for 1966 iii

39
42
45
48
54
57
61
65
70
76
81
86
90
94
97
05
11
12
13
14
16
18
20
22
24
26
28
30
32
34
35
i
xii
iii